

THE RAILWAY GAZETTE

A Journal of Management, Engineering and Operation
INCORPORATING

Railway Engineer • TRANSPORT • The Railway News

The Railway Times • Herapath's Railway Journal • RAILWAY RECORD.

RAILWAYS • ESTABLISHED 1835 • THE RAILWAY OFFICIAL GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

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LEEDS: 70, Albion Street Leeds 27174
BRISTOL: 20, Victoria Square, Clifton Bristol 33873
Annually £5 by post Single copies, Two shillings
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor: B. W. C. Cooke, Assoc. Inst. T.

Vol. 113]

FRIDAY, AUGUST 12, 1960

[No. 7

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The Human Element in British Transport

ALTHOUGH labour trouble is at present being experienced by the London Transport Executive, this results from unofficial strike action. The official attitudes of the National Union of Railwaymen and of the Associated Society of Locomotive Engineers & Firemen probably approximate that of Mr. Ray Gunter, M.P., President of the Transport Salaried Staffs Association, who blames individual unionists for conduct prejudicial both to the trade union movement and to the Labour Party. Nevertheless, union executives are not inactive—pay increases have been agreed for British Transport docks staff and for London Transport rail staff; the N.U.R. and the engineering unions have lodged a new pay claim for railway shopmen, and there has been a meeting at London Transport headquarters of union and Executive representatives to discuss the trouble at Neasden, Lots Road, and Greenwich power stations. This last situation has arisen from the awards which ended an earlier unofficial strike, also by London Transport maintenance staff, of a weekly 10s. for bad conditions and guaranteed weekly overtime payments of from 19s. to 24s. The operating men not unnaturally pressed for similar ad-

vantages, and both categories of staff were promised the 10s. a week "conditions" money, while the overtime payments—which had been awarded from week to week and as a temporary measure only—were withdrawn. It was in respect of these overtime payments that the maintenance men struck. On British Railways, some services have been cut because of staff shortages. While this situation might seem to favour implementation of advice reported to have been given by the Stedeford Committee—that the application of work study and use of new equipment would permit fewer employees to operate the railways more efficiently than at present—the superfluity to which the committee is believed to have referred probably occurs not in skilled categories (which are essential to keep the railways going) but in those which have no difficulty in maintaining their numbers. The Commission believes it is too soon to know whether the effect of the Guillebaud proposals will be to improve recruiting—the overall impression is that, in areas of high employment, it will not. It appears that a process of wage improvement is in operation which is automatic, and therefore highly effective: the working of the law of supply and demand.

Roger Gresley

ANOTHER link with the great days of the late Sir Nigel Gresley has been broken with the death on August 1, at the age of 54, of the younger of that celebrated locomotive engineer's two sons, Roger. Roger did not follow the true locomotive line, but was trained with Taylor Bros. & Co. Ltd., and was for some time with the Metropolitan-Cammell Carriage & Wagon Co. Ltd. After his war service, most of his time was occupied in the railway supply industry. He was Managing Director of G. Stephenson & Co. Ltd., and was connected with various other companies making railway equipment. He was a prominent member of the Transportation Club, and was one of a small sub-committee charged with examining its reorganisation. Unlike his father, his was not a dominating personality; on the contrary, he had no professional ambition, but was of a quiet and genial temperament, not without its cryptic moments—a man with a wide and affectionate friendship in Westminster engineering circles, yet one who did not load on others his private sorrows and troubles. To the end he remained one to whom all friends instinctively went straight over to greet as soon as he was seen.

Associations with South America

LINKS between the railways of South and Central America and the railway industries of Britain were strengthened last Monday. Senor Eduardo M. Huergo, President of the Pan American Railway Congress Association and a former General Manager of the Argentine State Railways, was the guest of the United Kingdom Railway Advisory Service at a dinner at the Savoy Hotel, London, at which the company included Mr. John Ratter, Member, and Mr. R. C. Bond, Technical Adviser, British Transport Commission; Brigadier C. A. Langley, Chief Inspecting Officer of Railways, Ministry of Transport, who is to lead the British delegation to the Pan American Railway Congress in Brazil in October, and representatives of other Government departments and of trade associations concerned with railways. Brigadier A. E. M. Walter, head of the International Inland Transport Branch of the Ministry of Transport and Chairman of U.K.R.A.S., presided. He emphasised the increasing amount of information and advice which British Railways and British industry could give railways overseas because of the experience which they now were gaining with motive power and equipment supplied for modernisation; much of this was electric, and the British Railways Electrification Conference, 1960, to be held in October, would show what had been and was being achieved in that sphere.

British Help for Overseas Railways

THE many training facilities afforded under Government and U.K.R.A.S. auspices for training on British Railways and the London Transport Underground and in the works of British manufacturers of railway material, of railwaymen from overseas were stressed by Brigadier Walter. He drew attention also to the missions which U.K.R.A.S. was glad to arrange to

examine and report on railway problems abroad. One of these, concerned with electrification in Pakistan, has just returned to Britain. All this, he pointed out, was in accordance with the desire of this country to help less economically developed and industrialised nations. Senor Huergo expressed his gratitude and that of his Association, and his confidence in closer relations with the railways which it represented. The links between Britain and the railways of Argentina and other South American nations date back many years. British enterprise created much of the railway system in that continent. British industry recently has continued to supply rolling stock and other equipment. It is to be hoped that the flow of railway material of unsurpassed quality, the result of wide experience, will increase, and that it will be supplemented by technical advice of greater value because it is based on knowledge of the newest techniques.

Overseas Railway Traffics

THE approximate railway revenue for the month of June, 1960, amounted to £1,663,000, an increase of £191,000 compared with June of last year. There was a rise in earnings from railway goods and passenger traffic which at £1,350,000 and £126,000 were £211,000 and £4,000 higher than the previous year. There were decreased earnings from most of the other services, the most significant being for the road services, where revenue fell by £15,000 to £31,000. Receipts from other coaching, livestock, and inland marine services fell by £600, £1,000, and £8,000 respectively. Canadian Pacific Railway revenue for the month of June amounted to \$39,343,758 compared with \$41,544,321 in June, 1959. Railway expenses amounted to \$36,119,830 (\$37,935,920) resulting in net earnings of \$3,223,928 (\$3,608,401), a decrease of \$384,473. Aggregate net earnings from January 1 to the end of June amounted to \$15,365,107 (\$17,006,480). Estimated railway and road service receipts of the Midland Railway Co. of Western Australia Ltd., in May, 1960, amounted to £A86,890 compared with £A84,151 in May, 1959, an increase of £A2,738.

L.T.E. Train Service Alterations

CHANGES in the trend of passenger traffic are shown by developments on the London Transport Underground. Some facilities are being increased, as by extension of the Metropolitan Line electrification from Rickmansworth to Amersham and Chesham, and the associated quadrupling between Harrow-on-the-Hill and Watford South Junction. These will make possible a considerably more frequent service. New signalling and flying junctions on the District Line in East London and Essex are improving punctuality. Against this, the policy pursued last year was to reduce poorly patronised services so as to reduce expenses and improve running. In February, 1959, the little-used branch of the District Line from Acton Town to South Acton was closed. The Central Transport Consultative Committee did not support the L.T.E. proposal to shorten the traffic day on all sections, but a reduction was effected in lightly loaded early and late trains on some lines. The midday off-peak service on the Piccadilly Line was reduced west of Barons Court, and on most lines Sunday services were cut. A new timetable introduced on the Central Line in October provided for revised frequencies on weekdays, and for full-length trains to be run on Thursday evening, the late shopping night in the West End.

Progress at Durgapur Steelworks

THE second of the four stages of the construction of the great steelworks at Durgapur in West Bengal has now been completed. This mammoth contract, worth approximately £105,000,000, and the largest single export order ever obtained by Great Britain, is being carried out by the Indian Steelworks Construction Co. Ltd. (ISCON). This consortium of 13 British engineering firms was formed in 1956 specially for the building of Durgapur. The plant is designed initially to produce 240,000 tons of commercial steel sections, 200,000 tons of light structural sections, 150,000 tons of billets for re-rolling, 100,000 tons of forging blooms and billets for sale, 60,000 tons of sleeper bars, and 40,000 tons of wheels and axles for railways. Little over 10 years ago there were three privately-owned iron and steel producing undertakings

in India. In addition to Durgapur, two other new Government plants, at Rourkela and Bhilai, are coming into production. A fourth is being established near Chandrapura in the Bokaro Coalfields area. Output of iron and steel from the six plants, Bokaro excepted, will in a few years time amount to some 6,040,000 tons.

Application of Work Study to Platelaying

TIME-AND-MOTION study methods are being successfully applied to platelayers in the York, Doncaster, Sheffield, Darlington and Newcastle areas. As a result of the increased efficiency obtained, some platelayers are earning an extra £1 to £2 a week. British Railways engineers are now considering notes on work study methods applied to tracklaying. Payment by results schemes have been adopted, and this has enabled the strength of each re-laying gang to be reduced from 25 to 19 men, resulting in a reduction in costs per 1,000 "allowed minutes" of about 27 per cent, and an increase in output of 40 per cent. Comprehensive work programmes are prepared on a daily basis, for a month at a time. The men are paid a bonus based on the total man-hours expended. During midweek, re-laying work on sidings and branch lines is authorised to occupy the gangs fully. The scheme is being extended to other districts, and it is expected that most gangs will be able to earn a bonus of about £2 a week.

New Station at Harlow

THIS week, we describe and illustrate Harlow Town, the new station on the Great Eastern Line of the Eastern Region of British Railways. Harlow Town replaces Burnt Mill, the small station which, with Harlow—another small station—served the rapidly-expanding town of Harlow. The old Harlow Station has been re-named Harlow Mill, and has been provided with a new signalbox which houses the route-setting control panel for the whole area. The new station is of bold yet very pleasing design, with its triple 50 ft. lift towers, glass-walled booking hall, and enclosed bridge spanning the tracks. Particularly good use of colour has been made: on the platforms, dark green, black, grey, and the burnished glow of brass provide muted contrasts with the careful use of white. Inside, brass is used with pale blue and the texture of varnished wood. The article on pages 189-92 also includes a full description of the modern signalling provided; although this does not incorporate features unusual in modern British railway signalling installations, it was thought that, as an example of current practice, its inclusion would be of interest, particularly to systems overseas in process of reorganising their own signalling.

Restrictions on Travel

EFFORTS are being made by the Foreign Office and Home Office to draft, in time for the 1961 holiday season, a travel document to replace the passport. It would be easier to obtain and cheaper than the United Kingdom passport, which costs 30s. Impetus has been given to these efforts by the popularity of the identity cards on which visitors from the Benelux countries and the German Federal Republic can travel to Britain for a stay of not more than three months. Pressure has been exerted in Parliament for port formalities to be removed or simplified. The British Government is opposed to re-introduction of a national identity card for British subjects but apparently insists on identity documents for travellers from and to these islands. Before the war of 1914-18, with unrestricted entry, Britain was, as it is today, a freer country than were a good many others, and cheaper and otherwise better to live in; but comparatively few undesirables made their way in, or not many more than enter today, despite restrictions. The disadvantages, including unemployment, of unrestricted movement could be offset by the benefits to our tourist trade. Meanwhile steps should be taken to mitigate the formalities which cause annoyance and delays at packet ports.

Winter Coal Traffic

DIFFICULTY is expected by British Railways in moving goods, including coal class, traffic next winter, mainly because of shortages of operating staff in the Midlands. Mr. Douglas Cory-Wright, Deputy Chairman of the Industrial

Coal Consumers' Council, has expressed misgivings as to the railways' ability to convey winter fuel, and is reported to have suggested greater use of road transport. It will certainly help if as much coal as possible is consigned between now and Christmas in anticipation of needs early next year and before any difficulties which may arise from severe weather in January and February. A procedure already exists for dealing with the latter. More coal is thought likely to be moved than last winter. Plans are being made to minimise the effects of any possible hindrance to the flow of traffic in the areas most affected, and British Railways is doing everything possible to recruit additional staff where it is most needed.

Child Trespassers

THE annual invasion of railway premises in Britain begins with school holidays when train-spotters settle down to fill notebooks with engine numbers. British Railways welcomes this interest of the younger generation. Nevertheless enthusiasm lures some boys to dangerous vantage points on or near the track, and quietly-running diesel and electric trains can be on top of a boy before he realises it. Where a small minority has damaged property and interfered with the staff and their work, stations have had to be closed entirely to enthusiasts. Recently a driver had to stop his train because his face had been cut by flying glass from the driving window, shattered by a stone thrown from a bridge. Overhead electrical equipment is dangerous only to the mischievous who climb signal posts, bridge parapets, and on to the roofs of vehicles, or try to touch the contact wire with a stick. Despite warning posters, five boys died recently as a consequence of trespassing. The British Transport Commission Police is to increase patrols and in serious cases British Railways intends to prosecute. In the Manchester and Liverpool areas a railway safety code for children has been circulated to schools. The most effective action lies with parents.

Dearer Transport in Paris

FARES on the Paris Métro were raised, by Government decree, on August 1. A booklet (*carnet*) of 10 tickets valid for any journey now costs 3.70 new francs (about 5s. 3d.) instead of 3 N.F. (4s. 3d.), and a weekly season ticket affording 12 journeys 3 N.F. instead of 1.60 N.F. (2s. 3d.); and a *carnet* of bus tickets has risen from 3 to 3.70 N.F. These increases have been imposed because of the rise in the deficit of the Paris Transport Authority (R.A.T.P.), which is now some £35,000,000 a year. Nearly two-thirds of this is attributed to unduly low charges. A Bill has been passed increasing the bonus which employers in the Paris area must add to wages and salaries, representing compensation for additional transport costs. As some Métro journeys are several miles long, fares have been, and remain, moderate; but many people do not receive the bonus, and, with the growth of private road transport, there may be considerable sales resistance to travel by R.A.T.P. train and bus services.

Hull-Liverpool Diesel-Mechanical Trains

A SINGLE glass-fibre moulding with wrap-round windscreen and a swept-back roof line to the driver's cab are features which clearly distinguish the appearance of the new diesel trains to be introduced shortly by British Railways London Midland and North Eastern Regions on express interval services between Hull, Leeds, Manchester, and Liverpool. The power and transmission equipment by British United Traction Limited is of similar basic layout to that of many hundreds of multiple-unit diesel-mechanical railcars already in service on British Railways. By the installation of eight B.U.T.-Leyland 900 Series underfloor engines of 230 b.h.p., giving each six-car formation a total of 1,840 b.h.p. available, the power/weight ratio has been considerably increased. The combination of Fluidrive hydraulic couplings and S.C.G.-Wilson epicyclic gearboxes is retained. A full description is given elsewhere in this issue. At Swindon Works, Western Region, where the inter-city trains are being constructed, particular attention has been paid to the problem of obtaining high end-compressive strength with stressed-body construction in steel. To meet this requirement a corrugated steel floor of special section has been welded to the fabricated underframe.

International Railway Research

STANDARDISATION of locomotives and rolling stock of the member administrations of the International Union of Railways (U.I.C.) is an ultimate aim of the Office for Research & Experiments (O.R.E.), of the Union, situated at Utrecht. At the recent 54th session of the U.I.C. Board of Management, Mr. J.P. Koster, President of the Control Committee of O.R.E., proposed to the Board in the name of the Committee that actual standardisation be postponed for the time being, but that an intermediate step be taken towards standardisation as a goal. This measure was the possibility to be opened for manufacturers and railways to have their locomotives answering the qualifications of a standard type, homologated by O.R.E., that is, by being put through an extensive series of tests. An idea behind this measure was to provide a ground on which the criteria for standardisation would become evident. Committee B13 of O.R.E. has been assigned the duty of working out these criteria. In the meantime it is pursuing standardisation of components and parts.

Many O.R.E. activities are mentioned in the edition of the *Bulletin* covering activities in the year ended March 31, 1960. The behaviour of pantographs at high speed, Question A3, is the subject of a further brief report in the *Bulletin*. Study of the question has occasioned three full reports with many appendices. The results obtained have already induced member administrations of O.R.E. to modify and perfect the design of pantographs, though the limit of progress has not yet been achieved. Studies meanwhile are being energetically pursued. Manufacturers have been informed of the modifications requested by the member administrations but have not had any detailed information as to the technical reasons which have led to these modifications. The reports provide a wealth of information on the tests carried out by the various railway administrations not only with their own types of apparatus but also with that of different design.

Reference is made in the *Bulletin* to the final report on Question B6. This relates to bogies for high speeds, and gives an account of the lengthy comparative tests carried out to assess the comfort factor in the various types of modern bogies, in almost identical conditions. The conclusions drawn may be of less immediate significance than the actual findings obtained during the tests, which latter may prove a useful guide to manufacturers.

The increase in the axle-load of goods wagons, at present restricted to 20 tonnes per axle, and in the weight of the trains, higher shunting and running speeds, the growing use of continuous brakes on goods trains, and the need for reducing damage to goods in transit, have given rise to the problem of protecting vehicles and loads by means of buffers with greater absorption capacity. Although some years ago, buffers with a work absorption capacity of approximately 1,300 lb. were considered satisfactory, this is no longer the case. The studies of the B36 Specialist Committee of O.R.E. have been directed towards determining the behaviour of buffers, under shock, in marshalling yards and that of buffers, in rafts, at starting and braking. Report B36/RP1, published in February, 1960, describes the behaviour of buffers under shock in marshalling yards and during fatigue tests and at low temperatures. A short account is given in the *Bulletin*.

In 1955 the Scandinavian Railways Association set up a committee to investigate the performance and expenditure occasioned by the use of diesel locomotives in Denmark, Norway, Sweden and Finland. As it was considered desirable that all calculations of operating expenses should be made in accordance with O.R.E. practice, a representative of O.R.E. was attached as adviser. The first meeting was held in Copenhagen in 1956. The final results of the work of the committee are summarised and commented upon in the *Bulletin*. As regards diesel-worked trains, the economies are stated to be largest with the Danish State Railways (30 per cent of the diesel investment) where diesel traction has been introduced for the main lines, and somewhat smaller with the Swedish State (averaging about 16 per cent of the investment), where the diesel working includes secondary lines with a comparatively low traffic density.

Comparison with results of electric operation shows that for the Swedish State Railways (with average savings of about 8 per cent of the investment), extension of the electrification is desirable, taking into consideration the low price of current

and the possibilities of linking up with already electrified lines.

In the case of the Netherlands Railways project, a comparison has also been made between diesel and electric operation of main-line locomotive-hauled traffic. Despite the traffic density of about 12,000,000 gross tonne-km. hauled per km. of line, electrification in Holland is not shown as economically very favourable, because of the high price of current supply. As a large proportion of main-line traffic was already being electrically operated, it was considered practical to proceed with the electrification until all the main-line traffic had been included, so as to have one mode of operation only. Moreover, as much of the traffic is being operated by multiple-unit trains comparative studies including both locomotives and train sets have been carried out, which have shown that the total savings obtained by diesel or electric operation are about the same.

The O.R.E. has drawn up regulations stipulating the general conditions for the sale of certain of its reports to industrial firms, to institutions, or to private persons. The *Bulletin* gives the text of the general regulations. A bibliographical analysis of the reports established in the course of previous years will be published shortly in the form of documentary leaflets indicating for each report the subjects dealt with. Any interested individual firm may now apply to O.R.E. for a report indicated in the list, against payment of the stipulated fee for the acquisition of the right to use the report concerned. This enables the firm to use freely, for its own purposes and for its customers, the results and data supplied by the studies and tests carried out by O.R.E. In the fees allowance is made for the intrinsic value of the information supplied by the reports as regards the possibilities of progress afforded by them. Fees remain moderate because they do not grant the acquiring party any exclusive rights. As these fees lessen O.R.E. expenditure, they make possible intensification of research work.

Rail Connections to Brazilian Capital

ON April 21, 1960, the President of Brazil, Dr. Juscelino Kubitschek de Oliveira, declared Brasilia open. From that day Brazil has had a new capital, but one of the most complex problems which has yet to be faced is that of its connection to the Brazilian railway system. The enormous size of Brazil is only one aspect of the problem. Two other very important ones must be taken into account.

First, the 5,300,000 sq. miles of Brazilian territory have always been divided into geo-economic regions more or less isolated from each other, each mainly autonomous in financial matters. These separate regions have often had closer and more direct relations with their respective markets abroad than with each other. Such a situation gave rise in each of them to railway systems equally local and autonomous, in no way forming a national system. In some cases; such as in that of the former Sao Paulo Railway, built by the British almost a century ago and run by the government today under the name Santos-Jundiaí Railway, the systems were designed to serve only foreign trade, chiefly export, having been planned with an eye to the country's or region's external market and not to the then almost non-existent internal market.

Another aspect of the problem is the variety of gauges and the technical condition of many lines. The Brazilian railways have gauges varying from 0.6 to 1.6 metres. Of the total of 21,875 miles of track, the larger part, 19,375 miles, is of metre gauge.

The connection of Brasilia to the two principal economic centres and their respective agricultural subsidiary zones, Sao Paulo and Rio de Janeiro, is not a difficult task and is already being performed. Brasilia's link with the Sao Paulo rail system depends simply upon the construction of 125 miles of track between Brasilia and Pires-do-Rio in the state of Goiás. The preparations for tracklaying are already completed. Once this line is installed, Brasilia will be linked to the state of Sao Paulo and also to the port of Santos, as well as to the Southern States and to Mato Grosso. The same link will establish communications with the so-called Minas Triangle, an important agricultural and cattle breeding region in the state of Minas Gerais.

The connection to Rio de Janeiro, central and north Minas Gerais and the Eastern States, especially Bahia, will depend on the completion of work already begun on the construction of a 288-mile line between Brasilia and Pirapora in Minas Gerais. Once these lines are completed the distances between

Brasilia and the principal centres of the country by rail will be as follow: Brasilia-Pires-do-Rio-Sao Paulo, 780 miles; Brasilia-Santos (seaport), 830 miles; Brasilia-Belo Horizonte, 528 miles; Brasilia-Belo Horizonte-Rio, 944 miles; and Brasilia-Salvador (Bahia), 1,310 miles. Brasilia will then be linked by rail with every State capital in Brazil, except Manaus (Amazonas), Belém (Pará), Florianópolis (Santa Catarina), and Cuiabá (Mato Grosso).

A British View of Russian Railways

ON May 29, a press party sponsored by the Eastern Region of British Railways travelled from London to Moscow on the first through sleeping car service from the Hook of Holland. The party, which spent four days in Russia, visited Losinoostrovskaya Station (the headquarters of Moscow district operating control and a wagon-sorting centre); the House of Railway Transport Technique in Moscow; and the Metro in Leningrad. The journey from Hook of Holland to Moscow was undertaken in an East German-built sleeping car. In Russia, the party travelled by "The Red Arrow." Russian railway operation and service was judged to be good: air-conditioning contributed to a high standard of comfort on the trains used by the party; riding was quiet and smooth. Novelties included round-the-clock "wet" and "dry" buffets, a shop, an ever-boiling samovar, a restaurant car conductor with an abacus, and a refusal to take tips. Meals were well prepared and served, and the free-standing armchairs were comfortable. Luggage was well handled at Leningrad by white-jacketed porters using lightweight barrows of chromium-plated tubular steel with rubber-tyre wheels.

The party found Losinoostrovskaya marshalling yard almost indistinguishable from British yards of comparable size and type—i.e., Margam or Thornton—but formed the impression that it was not typical. Supply and installation difficulties existed—there was plenty of "know-how."

The two section controllers enjoyed excellent conditions for concentration—each had a fair-size room with green-draped walls and a closed-circuit television receiver. Operating and technical methods were up to date: although not generally necessary, modern signalling where required comprised automatic or semi-automatic colour-light with track circuits and searchlight signals. Nevertheless, there was a great deal of hand signalling with ground frames in country districts. Russian operating conditions differed widely from our own—there was an almost total lack of gradients and tunnels in the areas travelled and the population was distributed in widely-separated concentrations. There was a national disregard of time. Late running was experienced and even "The Red Arrow" ran relatively slowly, with an average of 55 m.p.h.

Russian railway officers claimed that steam would be entirely replaced by diesel and electric motive power in the Moscow district by 1961; that the entire system ultimately would be electrified; that the Russian railwayman worked a 42-hr. week, had his own medical organisation and clinics, an unspecified retirement pension at 55, and that he underwent periodic medical and eyesight tests; that Losinoostrovskaya yard could handle 8,000 wagons daily; that freight trains averaged between 4,000 and 5,000 tons and could attain 8,000 tons, and that these weights could be handled by one locomotive—here the party bore in mind the gentle gradients and the top diesel-electric horsepower of 3,000. Route-mileage was said to be 78,125; the current five-year plan provided for the construction of a further 5,625 miles of track and for the duplication of 5,000 miles of single track. It was claimed that 6,950 million British tons of traffic had been carried per mile of line in 1958; by 1965, this figure was expected to have increased to 9,225 million. The annual passenger number had been 1,750 million in 1958. Electrification, at first using the 3,000 V. d.c. system, was now being standardised at 25,000 V. a.c., 50 cycles, with overhead conductor wires. The earlier electrification would not be converted: instead, research was progressing on a locomotive capable of working either voltage with automatic change-over.

All but 437½ miles of a scheduled electrification of 8,375 miles had been completed—the rest of the work would have been done by October this year. The party was also told that there were two locomotive construction works in the Union, that at present between 35 and 40 per cent of locomotives had radio-telephonic contact "with base," and that a few diesel-electric

six-coach multiple units had been built and were in service. All-steel passenger coaches were being replaced by vehicles making extensive use of light alloys and plastics; these were built in East Germany, Hungary, and Poland. Although most passenger rolling-stock consisted of sleeping cars, some open saloon-type coaches for day use were also being constructed. In areas of dense traffic, 1,250 sleepers to the mile were used and a heavy weight of rail. Concrete sleepers were becoming standard. The impression was gained that long-welded rails were used only in certain areas. The party learned that, during the first year of operation of the Metro in Leninograd, the government had voted two million roubles to meet the cost of working, that the workers had refused this offer, worked harder, and had presented 600,000 roubles to the government.

This information is based on a report prepared by Mr. T. A. Germaine, Assistant Public Relations Officer, Eastern Region, British Railways, who accompanied the party.

An American View

ACCORDING to the Americans, Russia is literally running the wheels off its railways. That is the view of eight American railway officers who, as guests of the Soviet Ministry of Railways, recently travelled 6,500 miles over Russian railways during a five-week period. Headed by Mr. Curtis D. Buford, Vice-President of the Operations & Maintenance Department of the Association of American Railroads, they included Mr. William M. Keller, Vice-President (Research) of Association of American Railroads; Mr. John F. Nash, Vice-President (Operations) of the New York Central System; Mr. Paul V. Garin, Manager of Research & Development of the Southern Pacific Company; Mr. Sergei G. Guins, Assistant to the Research Director of the Chesapeake & Ohio Railway; Mr. John W. Horine, Electrical Engineer of the Pennsylvania Railroad; Mr. Frank E. Woolford, Chief Engineer of the Western Pacific Railroad, and Mr. Lowell B. Yarbrough, Superintendent of Signals & Communications of the Wabash Railroad.

The delegation concluded that Russia was using her railways for over 90 per cent of her total internal transport. With only one-third of America's route-mileage, Russian railways handled 1½ times as much traffic—this performance was carried out by a work force of 3,500,000. Railways were virtually the only form of surface transport in Russia—there was little water traffic and this was seasonal because of freezing during the winter months. There was practically no inter-city highway system, and very little air traffic. There was an all-out effort in research and development: perhaps 3,000 trained engineers were working on rail problems, but actual progress was far behind that of Western Europe. When modern American express trains were described, Russian listeners simply refused to credit them. There was little or nothing of centralised traffic control, two-way train radio and microwave relay systems, push button freight yards with radar-activated retarders and remote-controlled switches, or of intricate track construction and maintenance machinery.

Locomotives were simply and robustly designed for operation with standards of maintenance skills and equipment far below those of the U.S. A limited number of basic freight wagons included only a very few wagons designed to meet special needs. There was extensive electrification, although steam power predominated and the locomotives themselves were not particularly advanced. Standardisation was more widespread than in the United States, and much progress had been made on interchangeability of parts. The Russians were trying to copy technical achievement on American railways because those were the only systems which were using heavy-tonnage vehicles, large motive power, heavy-duty track, and automatic couplers and airbrakes. Russian railways had applied automatic airbrakes and couplers to most of their vehicles. It was also claimed that 70 per cent of Russian freight wagons had been converted as four or six-axle vehicles. Russian technicians had access to all currently published American railway trade magazines and had obtained indirectly some of the Association's standards and manuals.

Trains ran relatively slowly: a transit time was set between two terminals and all trains operated with adjusted tonnage to make their runs in the same transit time. Speed of freight trains was between 30 and 50 m.p.h. Freight was dealt with

at stations comparable with military railheads: material was usually delivered by truck. There were few industrial sidings. Passenger trains ran between 40 and 55 m.p.h., though it was claimed that "The Red Arrow" and heavy traffic of high density reached 94 m.p.h. Passenger travel involved congestion, confusion and lack of comfort and convenience. Most people travelled in "hard" coaches with bare wooden benches. Minimum passenger fares provided only transport—a surcharge had to be paid for a seat. Passengers waited in stations for perhaps two days during the peak travel season: platforms were so crowded that people crawled underneath trains to get from one platform to another. Major stations usually had a lavishly-furnished V.I.P. room for important members of the Government, of the Communist Party, and of the railways themselves—the public was left outside. Russian sleeping cars were mostly of the wooden bunk type: "soft" sleeping cars incorporated spring cushions. Even with cushions, bunks were short, narrow, and very hard. The roadbed was extremely rough and riding of passenger coaches was very poor.

Russian railways carried top prestige—railway wages were generally higher than those of other industries. Block-apartment housing and extra benefits were provided for all railway employees. Excessive hard labour was used and there was extremely heavy use of female labour, which performed nearly all shovel-loading and unloading of wagons, cleaning of rights-of-way, and much heavy track maintenance work. The standard working week was 42 hr. There was virtually no overtime for extra hours. Everybody from the Minister downward belonged to the union: the primary function of union officials was to obtain compliance from employees on overall policies and objectives. All railways operated as a unit under the Ministry of Railway Transport. There were 35 regions, each including several operating divisions.

The American group travelled by train in a specially-assigned new-style all-room sleeping car, together with a specially-assigned dining car. Escorted or under surveillance at all times, the group was generally limited as to geographic area and in degree and detail of the work it was permitted to observe. In some places, the emphasis was on showing the group art museums and other sights of interest not related to the railways. It was not shown a rail-welding plant, permitted to observe the track from the rear of the train, or allowed to photograph or examine bridges or tunnels. It was also not permitted to visit the territory between Omsk and Novosibirsk in Central Asia, in which heavy rail traffic is reputed to occur. The group was received and conducted on visits by top railway officials who were very courteous and friendly at all times, and arrangements for transport, housing, and visits were carefully planned.

This information is based on a report issued by the Association of American Railroads, Transportation Building, Washington 6, D.C.

Operating Efficiency on Indian Railways

THE remarkable increase in the traffic Indian railways were called on to carry during the later 1950s brought about a revolution in operating methods as being the only way in which it could be met. The figures given below apply to what was admittedly the best Indian practice in that they are for the Dinapore Division of the Eastern Railway, winner of the Operating Efficiency Shield for the best performance in the year ended March 31, 1959. The records achieved were the result of an altogether new venture in India, the introduction of the "crack" goods train service.

This enterprise aimed at doubling efficiency in operation by making trains run 100 per cent greater mileage with the same engine and train staff. Actually, more than 100 per cent greater efficiency was required, because in addition to the running mileage being doubled, the question of locomotive detention from the end of the outward run until the return train was picked up at the turn-round station had to be considered.

The Moghalsarai-Gaya section began running crack specials in March, 1958, the initial number being four out of a total of 25 through goods trains. By March, 1959, 50 per cent of the through trains were "crack" specials, and the percentage has now risen to 100 per cent on all the main and some of the other lines of the Dinapore Division. Speeds also have been

correspondingly increased from 11½ to 14 m.p.h. in 1957-58 to 26 m.p.h. in February, 1960, practically the whole rise being achieved steadily throughout 1958-59. On the Moghalsarai-Gaya section with the highest goods-train density on Indian Railways, the "crack" special has provided the capacity needed to meet not only existing demands but also resources to enable continuing increases in traffic requirements to be met until the section is electrified in a year's time.

For the heavily-graded Barkakana-Barwadih section, part-dieselisation has been introduced and the efficiency of the crack steam trains has overcome the inherent difficulties of mixed steam and diesel traction. Nowhere does a diesel train take precedence over a steam train except when the latter has stopped to take water. Such stops have been reduced, and 70-wagon steam trains now run distances up to 75 miles without stopping for locomotive servicing. Great credit is due to the whole operating staff for these revolutionary changes, and there is no doubt that the "crack special" policy has raised the tone of the whole Division. It is already being adopted on other railways in India and might well provide a much-needed incentive if adopted in some other countries.

Railway Results to Mid-June

(By a correspondent)

IN four weeks to June 19 British Railways originated 18,140,000 tons of freight train traffic, an increase of 824,000 tons or nearly 5 per cent on 1959, but a decrease of 2,340,000 tons, over 11 per cent, from 1953. Merchandise was up 212,000 tons (7.5 per cent) to 3,022,000, a 14 per cent fall of 510,000 tons from the 1953 level. A rise of 635,000 tons (16.5 per cent) in mineral traffic to 4,493,000, left that total 130,000 (2.8 per cent) below 1953. The volume of coal and coke was only 22,000 tons less than in 1959, but 1,700,000 tons (13.7 per cent) below the 1953 forwardings. In handling the heavier traffic in the June period, the railways worked 27 million more ton miles; merchandise ton miles were up 25 million and mineral ton miles 36 million, while coal ton miles dropped by 35 million, or thereabouts. As freight train receipts declined by £190,000 (1 per cent) to £18,671,000, railway revenue was not improved by the additional traffic movement.

Aggregates for 24 weeks to June 19 show the same tendency for the railways to secure more traffic and do more work for an inadequate reward. While forwardings rose by 7,227,000 tons (6.6 per cent) to 117,328,000 and ton miles advanced by 394 million (4.7 per cent) to 8,753 million, freight train receipts increased by only £1,707,000, or 1.4 per cent. In contrast the Passenger Department lost 5,294,000 passenger journeys in five months to May, but raised its takings by £3,843,000, or 7.4 per cent, by charging on an average 2.6 pence more for each journey.

In the first 24 weeks of the year our railways forwarded 12,489,000 wagons with an average load of just over 10 tons. Loadings were 330,000 (2.7 per cent) over 1959 and the load was almost a third of a ton larger. The North Eastern Region despatched 129,000 more wagons (almost 6 per cent) with a load of 11.8 tons and the Eastern 111,000 more carrying 10.3 tons at starting points. These Regions also loaded more than 4.5 tons of merchandise apiece into 87,000 extra wagons. Their economical use of wagon capacity shows the strain thrown on the depleted stock of wagons by the London Midland light load of 3.88 tons of merchandise, averaged for 1,435,000 wagons or 30 per cent of merchandise loadings on the whole system.

The number of freight train miles run was 57,513,000, an increase of 619,000 (1 per cent). Steam locomotives worked 53,463,000 miles, 1,765,000 less than a year ago. Diesels accounted for 3,166,000 miles, a rise of 2,273,000 and electric locomotives for 885,000 miles, an increase of 111,000 (14 per cent). The expanding traffic reduced the speed of steam trains by 3 per cent to 9.21 miles an hour; regional figures varied from 10.8 miles an hour in Scotland to 8.8 m.p.h. in the London Midland Region. The all-line average diesel speed rose 29 per cent to 10.3 m.p.h., the variations in regional results being extraordinary. The North Eastern, running 257,000 diesel freight train miles recorded a speed of nearly 20 m.p.h.; the London Midland worked almost the same mileage at 6.6 miles an hour, a setback of 5 per cent. North of the Border

diesels ran 456,000 miles at 11 m.p.h., while the Western with a mileage of 144,000 slowed movement down to 8.2 m.p.h. The Eastern Region showed commendable enterprise in introducing the new motive power for working 1,803,000 freight train miles at 10.6 m.p.h., with further experience a higher speed should be registered before long. A 3 per cent recession in all-line electric train speed to 9.5 m.p.h. was disappointing.

An increase of 5.3 tons in train load to 152 tons may explain much of the slow traffic movement, especially in the London Midland Region, which raised its train load by about 10 tons to 170 tons. The Eastern Region load of 168 tons was less than half a ton heavier, but was well above the Western load of 152 tons and the North Eastern average of 146 tons. The combined effect of loading and speed factors was to raise the output of freight train operation by 1.8 per cent to 1,160 ton miles per train engine hour. The Eastern led with an output of 1,279 followed by the London Midland with 1,224 and the North Eastern with 1,201, while the Western lagged behind at 1,084, little above its 1959 output.

It is curious that the "wagon load throughout" was higher for all classes of traffic; 4 tons for merchandise, 14 tons for minerals, 12.9 tons for coal and coke. At the same time the average length of haul for all traffic shortened by nearly a mile to 70 miles; merchandise went an average distance of 134 miles, minerals 76 miles and coal 51 miles, 2.5 miles less than a year previously.

At June 19 the state of the rolling stock was lamentable. Of an operating stock of 13,383 steam locomotives, 2,568—or 19 per cent—were under repair. Of 463 diesel (mechanical) locomotives, 55, or 11.8 per cent, were unserviceable. The position with diesel-electrics was worse; 212 of the stock of 1,652, or 12.8 per cent, were under repair. To cap all, 15 of 100 electric locomotives, some of which were installed this year, were out of service. Altogether 2,850 of the total operating stock, or 18 per cent, were out of action. The number available for traffic was 12,748, compared with 13,312 a year ago, a decrease of 564.

The state of multiple-unit passenger carriages was little better, considering their short service. Of 3,503 diesel vehicles 331, or 9.4 per cent, were under repair and of 5,493 electric vehicles 430, or 7.8 per cent, were unserviceable.

The stock of freight vehicles at June 19 was 964,746. The number under repair was 62,282, or 6.4 per cent, leaving 902,464 fit for use. A year ago 914,789 vehicles were available for traffic, so that the railways in a better year have 12,325 fewer vehicles at their disposal.

Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

Making Branch Lines Pay

July 28

SIR,—I refer to Mr. A. E. Durrant's letter in your July 22 issue. Recently I travelled by train to Allhallows-on-Sea. The services were reasonably well patronised by day visitors, but apart from day trippers the branch must rely on the inhabitants of a hotel, a cafe, some caravans, and a village some distance away. The management of the oil refinery at Port Victoria is understood to be pressing for building of houses in the district for its employees. Construction of these, plus an equal number for general disposal, at Allhallows, would probably put the railway on its feet. Diesel or electric working could give a journey time to Charing Cross comparable with that from Southend to Fenchurch Street.

Will the local authorities permit this development? Good existing transport facilities are ignored when new towns or development are proposed, and new construction is carried out either where existing public transport is overtaxed or where there is none. Brackley and Woodford Halse, on the main line of the former Great Central Railway, both advertise to attract new industry. Railway facilities there are excellent, but are threatened with extinction for want of use. The London County Council wishes to build at Hook, in Surrey, where rail and road services already are overtaxed.

Yours faithfully,

R. G. R. CALVERT

45, Woodwaye, Oxhey, Herts.

THE SCRAP HEAP

? Special Class

The works manager telephoned the railway department. "Are you the passenger section?" he inquired.

"No," replied a seductive female voice, "I'm the goods."—*Transport Solaried Staff Journal*, August, 1960.

Canadian Casey Jones

The one-hundredth anniversary of the arrival of the first Canadian National Railways' train at Rivière du Loup revived tales of speed and daring on Canada's early railways. One of these stories concerned the old Montreal & Lachine Railway. In 1848, new Scottish-built locomotives arrived for trial runs. With engineers from the United States looking on, Superintendent Alexander Miller felt that the honour of Scotland was at stake. He mounted the footplate and the train completed the 7½-mile run in 11 min. The timetable listed the mileage as a 20-min. journey. After the furious passengers detrained, Miller appeared contrite and promised to behave. Once under way again, he gave the engine its head, and arrived in Montreal in 9 min. The story goes that he was called in by the President next morning and openly reprimanded, but privately congratulated.

Early Days on the Central London

The Central London Railway, of which the diamond jubilee is being celebrated by a special exhibition at Charing Cross Underground Station, was noteworthy among urban electric railways in two chief respects. In its early days it used electric locomotives to haul cars with end platforms equipped with gates. Multiple-unit sets soon began to replace the locomotive-hauled trains. Complaints of vibration disturbance to buildings over the line were received before the line had been open six months. All trains were multiple-unit by June, 1903. In 1911 the company started to carry parcels and mails, for which special

compartments were provided. A parcels porter sorted traffic *en route*. Collection and delivery were by tricycle, with wicker hampers for transfer between street and platform levels. Wartime staff shortage caused the service to be discontinued in 1917, and it was never resumed.

Potted Out

The pot of shrubs shown in the illustration is the chimney of a former Lancashire & Yorkshire Railway 2-4-2 radial tank engine, and stands on the platform of Brockholes Station on the Huddersfield to Penistone line, now in the North Eastern Region of British Railways. A correspondent states that on February 2, 1916, the tank engine was shunting on Penistone Viaduct which spans the valley of the Don. Suddenly, with very little warning, two arches of the viaduct collapsed and the locomotive fell some 80 ft. into the valley. The crew managed to get clear in time. Salvage operations and repairs took six months. The chimney of the engine found its way to Brockholes, where it has served as a pot for shrubs ever since. The pipe which supports it conceals all except the cap. A small concrete saddle would be a great improvement and would reveal a relic recognised by few passengers.

Engineering Definitions

The following definitions come to us via British Timken, Division of the Timken Roller Bearing Company:—

Foreman Very rarely seen except when you are filling in your football coupon.

Coolant pump A device so designed as to deluge the operator with oil or water when he is not looking.

Gauge An instrument made of metal which has the peculiar property of momentary expansion or contraction.

Drawing Pictorial representation of a dream seen in a trance by a medium.

Draughtsman A medium.



Photo]

[W. B. Stocks

Chimney of former L.Y.R. tank engine at Brockholes Station

Drawing office A trance.

Tool-grinder One who can grind a cutting-edge in such a manner as to leave it in exactly the same condition as before.

Reamer A device for producing various designs on a bore surface.

A Sentimental Journey

A retired engine driver, Mr. C. G. Smith, travelled to a scrap yard to stand for the last time at the controls of side-tank locomotive number 5818, which he had driven for over 21 years. Later he left the yard with a carefully wrapped parcel; it contained the regulator hand and whistle chain from 5818, exchanged for a shilling and an official receipt.—*Condensed from "The Acorn," the journal of Round Oak Steel Works Limited.*



Original Central London train, consisting of locomotive and gate-stock trailer cars, about to make a trial trip



Parcels service tricycle. Note season ticket rates quoted on poster

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

VICTORIA

Proposed Melbourne Cableway

A passenger cableway about 7,000 ft. long is being considered by the Melbourne City Council as an attraction for sightseers. It would traverse the city. The cables carrying the cars would be suspended from about 24 pylons. Two routes are suggested, both crossing the Yarra River and one traversing the Jolimont yards of the Victorian Railways.

WESTERN AUSTRALIA

Track Recorder Car

A recent acquisition by the Civil Engineering Branch of the Western Australian Government Railways is a new track recorder car in replacement of the existing vehicle which was considered unsuitable for the purpose for which it was intended. The car, classified "ALT5," was constructed at the Government Railway Workshops at Midland Junction using the underframe, bogies, and body shell of a condemned Sentinel Cammell steam railcar, with necessary modifications.

Principal dimensions and particulars are as follow:

Gauge	...	...	...	...	3 ft. 6 in.
Length over body panels	...	...	...	...	59 ft.
Width over body panels	...	...	...	...	8 ft. 9 in.
Width over lookouts	...	...	...	...	9 ft. 6 in.
Height from rail level	...	...	...	...	11 ft. 10 in.
Centres of bogies	...	...	...	...	40 ft. 7 in.
Bogie wheel base	...	...	...	...	6 ft. No. 1 end 6 ft. 6 in. No. 2 end
Dia. of wheels	...	...	...	...	31½ in.
Tare weight	...	...	...	...	27.2 tons

Living accommodation and amenities are provided for a team of eight. The equipment is installed at No. 1 end of the car in a compartment of approximately 11 ft. in length, which houses the Hallade track recorder, placed on the floor directly over the bogie centre pivot, beside speed indicators, gauges, thermometers and other instruments and equip-

ment. The car is fitted with sliding doors and gates and flaps at the ends to permit of communication with the adjacent coach. Telephonic communication can be made available between the car and the driver of the train, if desired.

Record Tonnage of Superphosphate

A record quantity of 439,000 tons of superphosphate has been carried by the W.A.G.R. this season. This is 41,000 tons greater than that carried last year and represents an increase of 33,000 tons over the previous record total of 406,000 tons in the full 1957-58 season. Increased use is being made of bulk superphosphate, which is unloaded direct from rail to road vehicles for spreading the same day. This year, 9,030 tons of bulk superphosphate were carried by rail, compared with 2,500 tons last year.

INDIA

Ticketless Travel

The State-owned railways lose about Rs.50,000,000 (£3,750,000) a year because of non-payment of fares. This was stated last week by Mr. Jagjivan Ram, Minister of Railways. The loss, he said, would have been much higher but for strict checking of tickets by railway staff. The railways, the Minister added, employed about 15,000 ticket examiners. Rs.30,000,000 (£2,250,000) a year was paid by the railways towards claims by passengers for loss of luggage, mostly due to pilferage and theft.

Eastern Railway Developments

Next year much of the coal for the Bhilai steelworks will come from the new coal-washing plant at Dugda near Chandrapura in the Bokara coalfield area. The large railway yard to serve this washery is expected to be opened for traffic in December. Of the five new branches of the Eastern Railway in the neighbouring Karanpura and near-by

coalfields, three have been completed. Also, the Muri-Ranchi section of the Chandrapura-Bondamunda construction—described in our issue of June 26—August 14, 1959—40 miles in length in difficult country, is expected to be completed very soon. Until this direct route via Ranchi to Bondamunda is completed the Dugda-washed coal will have to go to Rourkela and Bhilai plants via Muri, Chandil, and Sini junctions. A new line 33 miles long is to be constructed in the former Eastern Bengal Railway area near Calcutta from Baraset to Hasnabad; it will be of 5-ft. 6-in. gauge.

Bhilai Steelworks

The new steelworks at Bhilai on the Howrah (Calcutta)-Nagpur main line of the South Eastern Railway, opened in October, 1959, has already produced over 100,000 tons of steel. Three open-hearth furnaces are in production with an output of 1,500 tons daily, and three more are expected to be completed by the end of the year, when the total annual capacity should be over 1,000,000 tons. The new 50-mile electrified branch line is bringing iron ore into this plant, and a new marshalling yard is also part of the railway undertaking at Bhilai. The produce, in the form of billets and slabs, is being carried by rail to various rolling mills in different parts of India; the quantity so far moved is about 60,000 tons. The intake of coal is being carried from the Bihar and West Bengal coalfields several hundred miles by rail to Bhilai.

SOUTH AFRICA

Railway-owned Helicopters

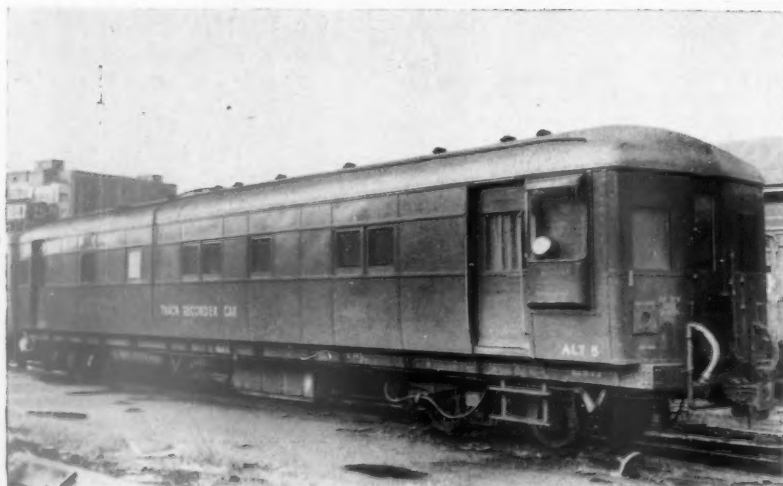
South African Railways has financed the purchase of two helicopters at a cost of £67,000 for use by themselves and other Government departments. They are expected to be put into service by the end of the year and will solve one of the Railways' greatest problems: getting doctors, medical supplies, and officials quickly to serious rail accidents on difficult stretches of line. The helicopters will also be used for aerial surveys before constructing new lines and for reaching stranded trains, as well as for aerial photography, and for low aerial inspection of harbours, marshalling yards, and large station layouts.

UNITED STATES

Rejection of Rail Merger Proposals

The Chesapeake & Ohio Railway has rejected a proposal to resume three-way merger negotiations with the Baltimore & Ohio Railroad and the New York Central System.

Mr. Walter J. Tuohy, President of the Chesapeake & Ohio Railway, accepted an invitation to meet the presidents of the two other railways on August 15 to discuss the merger situation, but he made it clear that the company was not willing



Western Australian Government Railways Class "ALT5" track recorder car

to give further consideration to a three-way consolidation.

CANADA

Staff Hostel at Montreal Yard

A hostel for train crews is being built at the new hump yard at Montreal. It will be built and maintained by the C.N.R. and operated by the Y.M.C.A. The building will be three storeys high, fireproof and faced with brick. On the first floor there will be 20 single bedrooms, a cafeteria seating 52, lockers, and washrooms. The second and third floors will each contain 26 bedrooms and a recreation room will be located on the second floor.

Aluminium Collapsible Containers

New collapsible containers of aluminium alloy have been introduced in Canada for the railway shipment of freight. Two sizes of "Tracon" container, 9 and 16½ cu. ft., weigh 55 and 62 lb. respectively and can carry a weight of 330 lb. When empty these units collapse to one-fifth of their size for return to the shipper.

Passenger Stock

The serious shortage of modern passenger carriages on the Deutsche Reichsbahn is being made up in part by the current rebuilding of some 3,000 old two-axle and three-axle carriages into up-to-date three-axle units with accommodation for local traffic. Most of the rebuilds had wooden bodies, and these are being replaced by steel bodies, but

the old steel underframes and the axle-boxes and wheel-and-axle sets are being retained, though they are 40 to 50 years old. The rebuilds have a wheelbase of 24 ft. 6 in. and a body length of 43 ft. Entrance vestibules are at each end, but each side has only one door, with an opening 4 ft. 3 in. wide. There are 48 one-class seats on an empty weight of 19 tons. Rubber bolster gangways, as standardised in Western Germany, are applied to these Reichsbahn coaches, which are to be worked in close-coupled sets. Rebuilding is being carried out mainly at the Leipzig, Halkerstadt, Schönebeide, and Wittenberge repair shops.

WESTERN GERMANY

Named Express Trains

New names for Federal Railways expresses include the "Hook-Basle Express" and the "Basle-Hook Express" (D752/751); the "Meistersinger" Nuremberg-Linz; and the "Kattagat Express" (night train between Hamburg and Frederikshaven, in Denmark).

AUSTRIA

New Austro-German Service

During the period of the summer timetable an additional fast passenger service is being operated between Linz and Nürnberg via Passau. Operated by a four-car multiple-unit train of the Austrian Federal Railways, the new service is known as the "Meistersinger". Leaving Nürnberg at 9.05 it reaches Linz

at 13.16, and gives a 10 min. connection with the eastbound Orient Express, due in Vienna at 15.40. In the reverse direction Linz is left at 16.00 and reaches Nürnberg at 20.11, and the connection from Vienna is by a departure at 13.40 from the West station of that city.

CZECHOSLOVAKIA

Electric Locomotives for U.S.S.R.

A batch of electric main-line locomotives is at present being built in the V. I. Lenin Works in Plzen to the order of the Soviet import corporation of Machinimport. The locomotives are intended for the haulage of heavy long distance express trains on trunk lines electrified at 3,000 V. d.c.

The Skoda 41 E locomotive is designed as an adhesive engine, type Bo Bo, with two bogies and four traction motors for the individual drive of the axles. The traction motors are fitted in the bogie frame and the driving power is transmitted by a universal joint type flexible coupling.

ITALY

New Rail Construction

Over a period of 10 financial years some Lit. 12,000 million are to be spent by the Ministry of Public Works on the construction of a new line linking Paola with Cosenza. A line is already in operation between the two towns, but the tortuous route it follows makes it unsuitable for modern railway traffic requirements.

Publications Received

C.I.M.A.C. Conference, Wiesbaden, 1959. International Congress of Combustion Engines. Frankfurt/Main: Brentanostrasse 29. Obtainable also from Maschinenbau-Verlag G.m.b.H. Barckhausstrasse 16. 9½ in. x 6½ in. 1,128 pp. Illustrated. Price DM. 120. The full text is given of 35 papers read, and of the discussions thereon, at the conference of the International Congress of Combustion Engines (C.I.M.A.C.) held at Wiesbaden on June 14-19, 1959. The subject of the conference was diesel engines and gas turbines up to 1,500 h.p. This is probably the most valuable single publication available to designers and others wishing to obtain a good cross-section on prime-mover research throughout the world. The papers are classified under the general subject headings: supercharging of diesel engines; thermal and heat-transfer problems of diesel engines; problems of refrigeration of charge air and of fuel injection; special problems of combustion engines; flow and combustion; special problems of gas turbines; component design of diesel engines; and experiences with diesel marine engines. Papers are printed in the language in which they were presented, either English, French, or German, and the discussions are similarly treated. In addition a summary of each paper is printed in all three languages. Other contents include

a list of member-associations, presidency and committees of the 1959 conference, sponsoring members, participants, the general programme, and speeches given at the opening and closing sessions.

Durgapur.—This well produced and illustrated booklet summarises the work already completed at Durgapur Steelworks in West Bengal as well as giving details of the project. The Indian Steelworks Construction Co. Ltd., which is building the steelworks recently completed Stage 2 of this four stage programme well up to the schedule laid down in October, 1956, and a complete timetable of the stages in the erection of the plant is given. Copies of the booklet can be obtained from C. S. Services Limited, 5, Carlos Place, London, W.1.

On Railways at Home and Abroad. By P. Ransome-Wallis. London: Spring Books, Spring House, Spring Place, N.W.5. 8½ in. x 6 in. 300 pp. Illustrated. Price 6s.—These readable accounts of the author's travels in many countries over 30 years, are greatly enhanced by the many photographic illustrations. Some of these, such as those of the *Egyptian Atlantic* at the head of a train from Ismailia to Port Said, and of the *Golden Arrow* leaving Calais, are well reproduced. All are of interest. Some of the descriptions, as of the Beyer, Peacock and other

engines of the Netherlands Railways in steam days, are excellent. Dr. Ransome-Wallis puts to good advantage a wide general knowledge of railways.

Spacesaver Wedge-Belt Drives.—An 80-page catalogue of Spacesaver wedge-belt power-transmission equipment for which an illustrated description appears elsewhere in this issue. Full information is given concerning the stock sizes of belts and pulleys available and detailed instructions are included to aid the choice of a satisfactory drive for a wide variety of purposes. Copies may be obtained from J. H. Fenner & Co. Ltd., Hull. Applications should refer to catalogue No. 135/20/72.

Indian Railways Annual, 1960.—Joint Director, Public Relations, Railway Board, New Delhi. 310 pp. 10½ in. x 8½ in., paper cover, illustrated. No price stated.—This well-produced and profusely-illustrated volume gives up-to-date information mainly on Indian but also on a few other railway developments. The Minister of Railways, Mr. Jagjivan Ram, and the Deputy Minister, Mr. Shah Nawaz Khan, contribute introductions. The articles, of general and technical interest, are by the former Chairman of the Railway Board, Mr. K. B. Mathur, the General Managers of the railways, and other senior railway officers.

Express Diesel Multiple-Unit Trains

British Railways six-car sets for Hull-Liverpool inter-city services of London Midland and North Eastern Regions



Six-car train with under-floor diesel power showing wrap-round windscreen

FOR the inter-city express diesel passenger service being established between Hull and Liverpool by British Railways London Midland and North Eastern Regions, to which reference was made in an editorial note in our July 15 issue, 34 power cars and 17 trailers are in course of production at Swindon Works, Western Region. These figures include for the supply of spare cars. The vehicles have been designed to the same standards of strength and comfort as those applying to main-line locomotive-hauled coaches of British Railways.

Normally the cars will be formed in trains of six; in each six-car unit there will be four powered cars, totalling 1,840 b.h.p., and two - intermediate trailers. Marshalling is as follows: leading driving motor composite; motor brake second; trailer first buffet; trailer open second; motor brake second; driving motor composite.

Seating for 292

Total seating accommodation is for 60 first class passengers and 232 second class. Of the two types of powered car the driving motor composites each have open saloons with seats for 21 first class passengers and 36 second class; these vehicles have no gangway connection at the leading end and the driver's cab extends the full width of the car. The motor brake seconds each have accommodation for 48 passengers in six compartments; there are two lavatories and a combined guard's compartment and luggage van.

The trailer first buffet car has compartment accommodation for 18 first class passengers. The buffet portion includes a grill and bar; there is also table seating for

eight and standing space. Meals can be served into the three first class compartments. The trailer open second has accommodation for 64 passengers; it has two lavatories.

Stressed-body Construction

All the cars are 64 ft. 6 in. long and 9 ft. wide at the waist. They have been designed to resist an end-compression load of 200 tons. Buck-eye automatic couplers and B.R. standard gangways are used. The stressed-body principle of construction with the underframe, body-

sides, and roof combined in a single welded structure which resists all bending, compression, and draught stresses leaves the underframe completely free from conventional trussing and provides the maximum space below floor for the suspension of diesel and auxiliary equipment and for its subsequent maintenance. The underframe is fabricated from rolled-steel sections on to which is welded a corrugated steel floor of special section. This considerably increases the strength of the vehicle in its resistance to end shocks.



Interior of first class open saloon

The leading-end bodywork of the driver's cab is formed by a single glass-fibre moulding and is in a modern styling with swept-back roofline and wrap-round windscreen. The bodysides are of pressed-steel framing members with outside panelling of 16 g. steel; these and the roof are jig-built sub-assemblies. The lower section of the roof panelling is of 8 g. plate which forms a continuous welded structural member extending the full length of the car. The whole interior face of the bodysides, ends, and roof is insulated with sprayed asbestos and the upper surface of the corrugated-steel floor is completely filled with the same insulating material. The floor surface is covered with insulating hardboard. Trap doors in the floor facilitate inspection and maintenance of the diesel equipment.

Windows in the first class accommodation and principal windows in the trailer buffet are double glazed. Beclawat sliding-shutter ventilators are incorporated in side windows throughout the

remaining cars. Glass is secured by rubber mouldings which retain a flush exterior bodyside and protect the edges of the steel panelling. Bodyside doors, supplied by Lightalloys Limited, are of cast aluminium and incorporate balanced drop windows.

The bogies have a wheelbase of 8 ft. 6 in.; are of riveted construction from rolled-steel sections and fabricated sub-assemblies. The rolled-steel disc wheels are 36 in. dia. Timken roller-bearing axleboxes are provided with manganese-steel liners. Special attention has been given to alignment of the horn-guides by mounting the complete bogie frame in a jig while the four horn gaps are machined. This ensures that the renewable manganese liners fitted are all perfectly square without the use of shims.

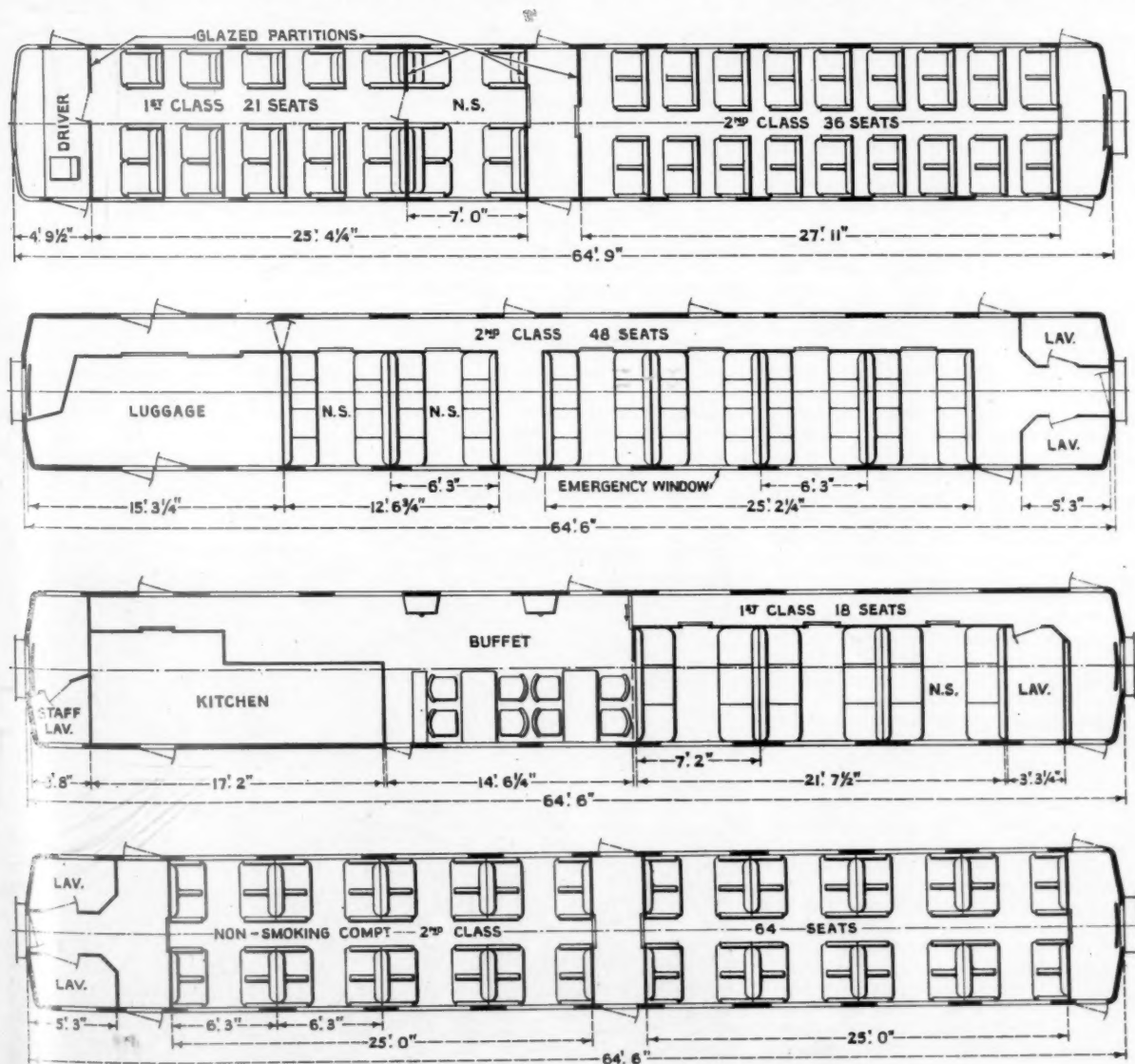
Hydraulic Shock Absorbers

The side plates are carried on laminated-steel springs with rubber auxiliary bearing springs. The bolster is

mounted on nests of helical springs carried on suspension bolts hung from the bogie frame on rocker washers; lateral movement is damped by a large Woodhead - Monroe hydraulic shock absorber. To reduce noise transmission from the track the centre and side bearings are both mounted on rubber.

Modern Decorative Schemes

First class open saloons are panelled in plastic, the walls in Formica tapestry dove grey which contrasts with the partitions of veneered walnut panels. The ceiling is in Formica ivory soft glow. Mouldings round the doors are in polished walnut. The window moulds are anodised aluminium and windows are furnished with curtains of grey fabric. Luggage racks of anodised aluminium run the complete length of the saloon on both sides. The seats, which are of a new profile, are built on a tubular frame supplied by G. D. Peters & Co. Ltd. Seat fillings of Dunlopillo are upholstered



Plan layouts of leading driving motor composite, motor brake second, trailer first buffet, and trailer open second



Buffet portion of trailer first buffet car showing table seating and standing space. Note abstract design on kitchen partition

in blue and black cut moquette. The floor is covered with a charcoal-shade linoleum and mist blue and black carpet runners.

The finish of the first class trailer cars is generally similar to the British Railways standard first class coaches. The compartments and corridors are finished throughout in polished veneered timber, sapele mahogany surface in compartments and Formica tapestry dove grey in corridors and vestibules. The luggage racks and other metal fittings are in anodised aluminium. The seats are upholstered in a blue and black moquette.

The décor in the second class saloon is very similar to the first class saloon with the exception of the partitions which have opaline green softglow inset panels above and below the windows. The floor is covered with linoleum coloured pigeon grey marble. Blue, grey, and black seat moquettes are used for smoking compartments and green with black for non-smoking compartments. Headrolls are of a light fawn Vynide.

Second class compartments have walls of Formica tapestry dove grey with ceilings of Formica ivory soft glow. Seat moquettes are as in the second class saloons but without the Vynide headroll. The buffet saloon is decorated with Decoplast ribbon blue hopscotch pattern and Formica pantomime lavender.

The lavatories have walls finished in Formica tapestry dove grey to harmonise with the aluminium metal fittings. A primrose yellow suite has been fitted in the first class and a white suite in the second class. Floors are covered with Armstrong Accoflex tiles.

Fluorescent lighting is installed in the first and second class saloons; each fitting incorporates a transistor-invertor unit, tube, and shade.

Vacuum Brakes

Automatic vacuum brakes incorporating two 21-in. vacuum brake cylinders and direct-admission valves are fitted to all vehicles. The cylinders are mounted in the centre bay of the underframe and

apply the brake with a clasp action to each wheel. The brakework throughout is bushed with Oilite bearings and is fully equalising. The Gresham & Craven two-pipe system, with 15-cu. ft. reservoirs on each vehicle, enables the brakes to be released almost instantaneously irrespective of the exhauster speed. The passenger-communication and deadman's control on the throttle both incorporate Gresham emergency valves to ensure full application of the brakes.

Control of Combustion Heaters

Heating is by means of two Smiths combustion air heaters in each car mounted under the floor. Warmed air is conveyed through ducts to the interior of the vehicles. On compartment vehicles warm air discharges through apertures under each seat and passenger-operated

temperature controls are provided on each side of the compartment. Surplus warm air not required for heating compartments is discharged through grilles into the corridor. In open saloons also warm air is discharged through apertures below the seats but the temperature regulation is fully automatic with operation of the heaters controlled by wall thermostat mounted in the saloon. In warm weather all the heaters may be switched off and filtered air, at ambient temperature, circulated throughout the car.

Underfloor Power Equipment

All the power equipment has been supplied by British United Traction Limited. Two engines with transmission and auxiliary equipment are mounted below the floor of each power car. The engines are of the B.U.T.-Leyland six-cylinder horizontal 900 Series, with a maximum output of 230 b.h.p. at 1,900 r.p.m. These are fitted with 22 in. Fluidrive couplings. A short cardan shaft and freewheel connects each engine to a four-speed S.C.G. Wilson epicyclic gearbox which carries pulleys at the input end for the belts driving the exhausters and electric generator. A further cardan shaft connects the gearbox to the forward-and-reverse final drive mounted on the inner axle of each bogie.

Each engine has its own cooling system, with header tank and fan-cooled radiator driven through a right-angle drive from the front of the engine. The throttle, gearbox, and final drives are electro-pneumatically operated with the e.p. valves grouped together in boxes carried on the underframe; the compressed air is fed from storage reservoirs supplied by air compressors mounted on the engine. The control equipment allows for a maximum of six power cars to be operated from any driving cab.

The electrical control circuits are

(Continued on page 194)



Interior of second class saloon in driving motor composite car

New Station at Harlow, Eastern Region

First new station for a new town provides modern setting for introduction of electric trains in November



Night view of the front entrance of the new station

THE dominant features of Harlow Town, the new Great Eastern Line station, are its triple 50-ft. lift towers, glass-walled booking hall, 300-yd. platforms, and the waiting room which is on an enclosed bridge spanning the station.

A few years ago, with a population of about 3,000, Harlow was adequately served by the two small stations of Harlow and Burnt Mill. Neither of these stations was equipped to absorb the "bulge" of Harlow's expansion in population, which is expected to reach 80,000 by 1965.

Nearer the heart of the housing estates, Burnt Mill was chosen as the site for the new station. It is separated from the town centre half a mile to the South by an area reserved for parks and playing fields. The station forecourt will form the nucleus of a small commercial centre and parking space for 400 cars will be provided.

Work began early in 1959 with the gradual demolition and replacement of the old buildings. When almost completed, the new station was given a new name: Harlow Town. Harlow Station, $1\frac{1}{2}$ miles along the line, was re-named Harlow Mill.

Station Buildings

A short access road approaches the station directly from the town's ring road. Passengers enter through the 50-ft. wide, 40-ft. deep, and 17-ft. high glass-walled concourse, around which are a fully-mechanised ticket office, public telephones, bookstall, tobacco kiosk, and stationmaster's office.

The Enquiry & Parcels Office and a large parcels yard are on the east side,

while on the west is under-cover storage for 150 bicycles. The station is equipped with automatic train departure indicators and a public address system.

The concourse gives access to two island platforms by stairways to and from the overbridge, on which are situated the public and staff amenities. In addition to the waiting room on the bridge, there are five glass-walled passenger shelters on the platforms.

The station buildings are heated throughout by hot-water pipes embedded in the floor surfaces and the modern lighting has been specially designed to enhance the station's appearance both by day and night.

Master Clock

A special transistorised crystal chronometer—the first to be used in the Eastern Region—has been installed in the concourse. Employing 53 transistors and controls 11 "slave" clocks, it is accurate to within half a second a week. The conventional pendulum action is replaced by a crystal oscillator, the frequency of which is divided to produce an accurate time source to give $\frac{1}{4}$ -min. impulses. The clock also will be used to control those to be installed in Harlow Mill goods depot.

Parcels and packages are not handled in areas used by passengers. All parcels traffic is conveyed between platforms by three lifts.

As the four-acre site of the station is in low-lying marshy ground, the land had to be drained for nearly a month before work could begin. Nearly 300 piles had to be driven, some to a depth of 25 ft. More than 150 were needed to carry the

platforms and a further 130 were used for the main building. The site had to be filled with 3,000 wagons of spoil to avoid risk of flooding.

The overbridge deck was constructed of pre-stressed concrete units on reinforced concrete bearings cantilevered from the lift shafts. This allowed the bridge to be built with minimum interference to trains.

The concourse roof is supported by a concealed framework of pre-stressed concrete beams cantilevered from four pre-stressed columns. Staircases are of reinforced concrete on load-bearing brickwork. The parcels office, cycle store, overbridge roof, and platform canopies and shelters are steel-framed with timber beams specially designed for quick erection. The lift towers are of reinforced concrete construction. Roofs are covered with three-layer felt on timber boarding. As a special fire precaution, the whole of the structural timber has been impregnated to prevent flame spread.

Facing bricks are Ryarsh "Heather" flint lime with dark pointing in the horizontal joints, and the plywood fascias of the roofs are painted dark green. Window frames are of steel.

Interior Treatment

The interior treatment develops naturally out of the external form and finishes have been chosen for hard wear and minimum maintenance. Blue quarry tile floors, pale blue glass mosaic walls, and varnished timber ceilings have been used for the public areas.

A new track layout was necessitated by the construction of the station. There are now four lines through the station

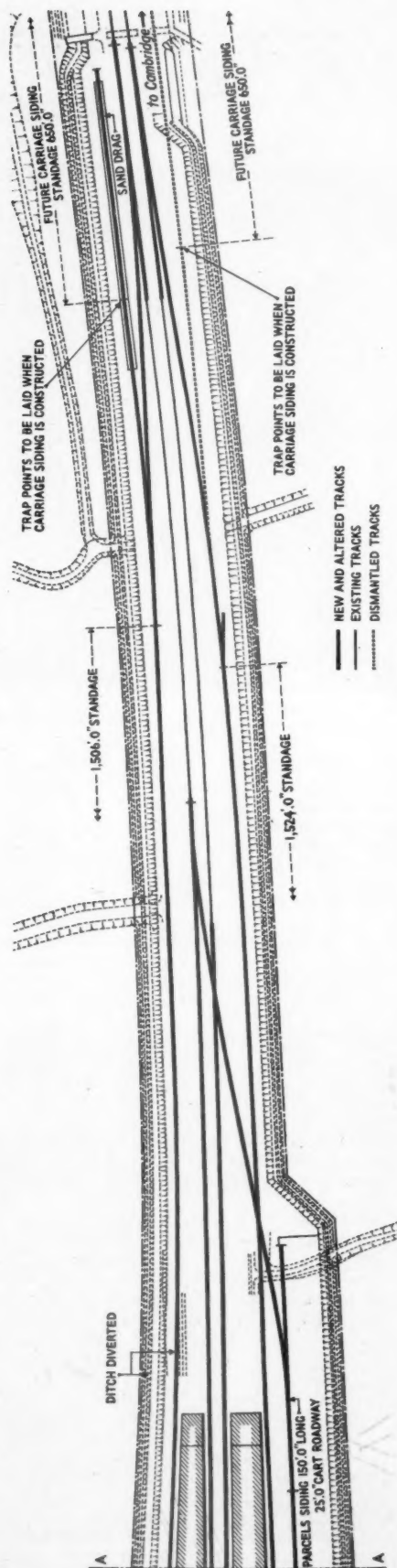
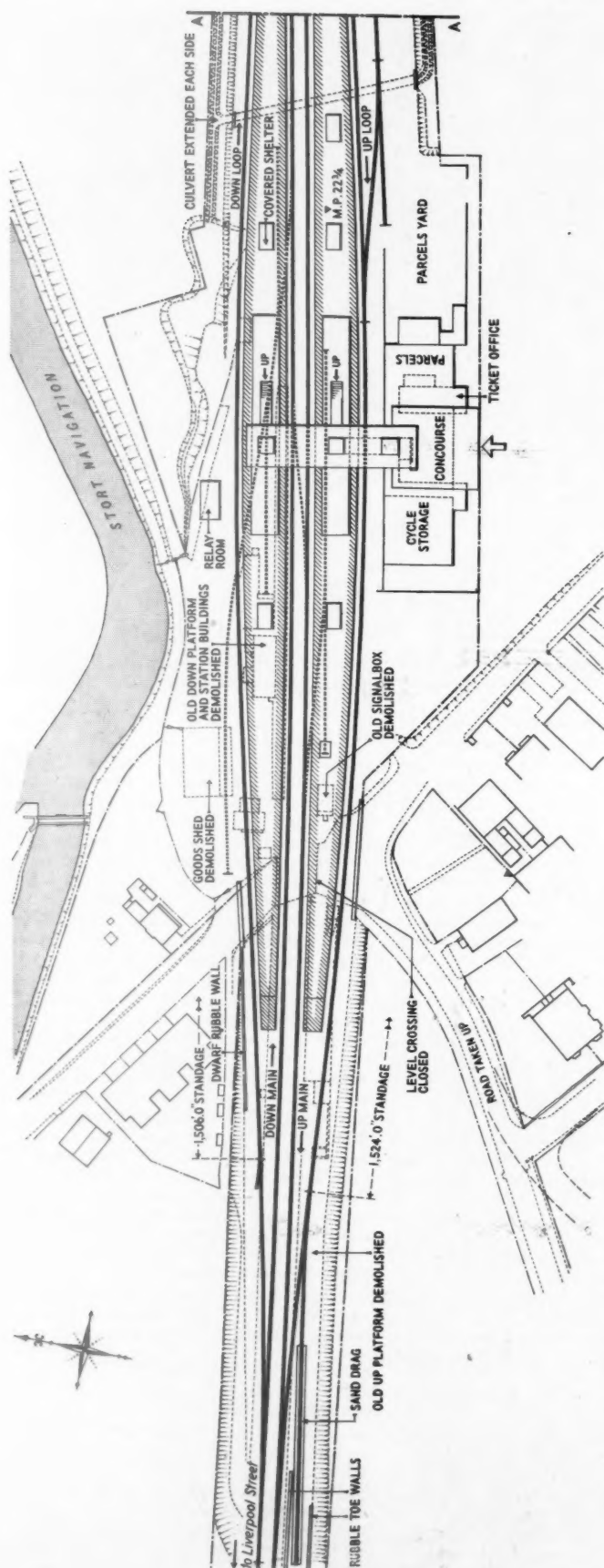


Diagram in two parts, showing the new track layout at Harlow Town Station. The diagram shows new, altered and existing tracks, together with the position of those tracks which have been dismantled

instead of two: an Up and Down main line and loops in each direction. The latter can be extended to form carriage sidings. Also on the Up side is a siding for dealing with parcels, newspapers, and similar traffic.

The new track layout has meant extensive signalling alterations. Semaphore signalling is replaced by "search-light" type colour-light signals, controlled by a new signalbox at Harlow Mill, which houses the route-setting control panel for the whole area. The signalboxes previously in use at Burnt Mill and Harlow are no longer required.

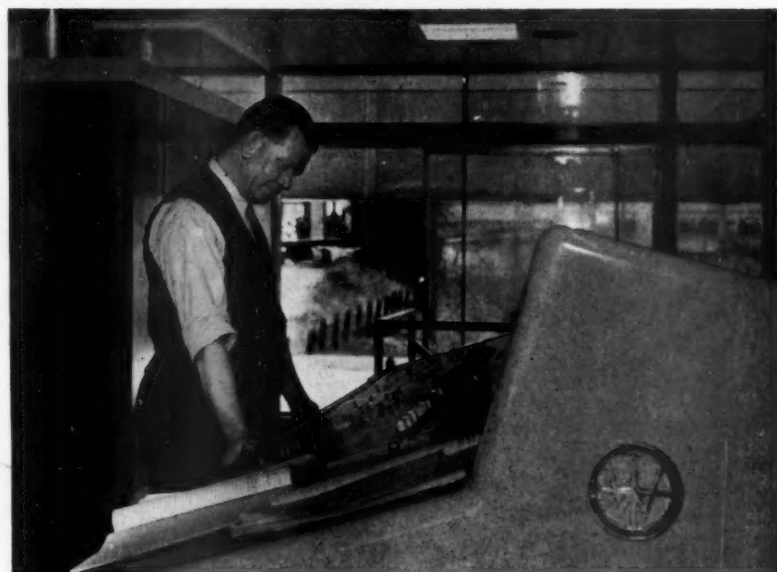
New Signalbox

A new signalbox of modern design with accommodation for the Signal Engineer's maintenance staff has been built at Harlow Mill Station. Control of equipment associated with the installation is effected from a desk-type panel bearing a geographical representation of the track layout.

Route-setting is accomplished by the operation of push buttons. When the button at the entrance is operated, a light within the button commences to flash and continues to do so until the button at the exit is similarly operated. The light in the entrance button then glows steadily.

White route lights are provided along each signalled track. These consist of small lamp visuals spaced about 2 in. apart. Provided the interlocking conditions are correct, the route lights become illuminated after the operation of the exit button—with the exception of the lights situated at the toes of the switches. These latter lamps serve also as indications that the points are in the correct position.

After the route has been established, the points throw to the required position and when detection is obtained the remaining route lights become illuminated. Providing that the appropriate



Signalman at control panel, Harlow Mill signalbox

track circuits are unoccupied the signal will now clear.

After the train passes, the signal goes to danger and the white route lights change to magenta as each track circuit in the route becomes occupied. As the track circuits clear after the passage of the train the white route lights reappear and remain lit until the route is cancelled.

Cancellation

Cancellation of the route is effected by pulling out the push button at the entrance to the route and then releasing it. Providing that the approach locking conditions have been satisfied, the lock relay will operate to the normal position and the route will be clear.

Where a subsidiary route exists at the

same location as a main route, a separate push button is provided. A yellow ring around this button distinguishes it from main signal buttons, which have a red ring. Signal indications are given by a lamp adjacent to the button. This lamp changes colour from red to green when the signal clears. The indication for a subsidiary signal takes the form of a lamp—normally out—located close to the main signal indication. When the subsidiary signal clears the red indication remains and the subsidiary indication shows a green light.

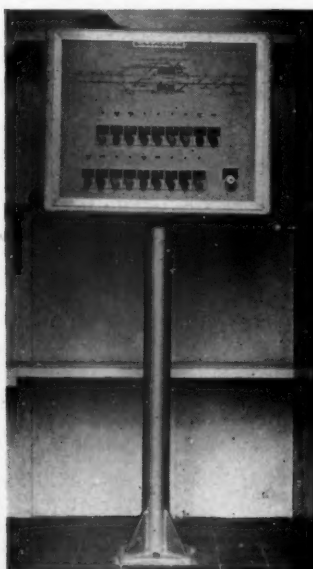
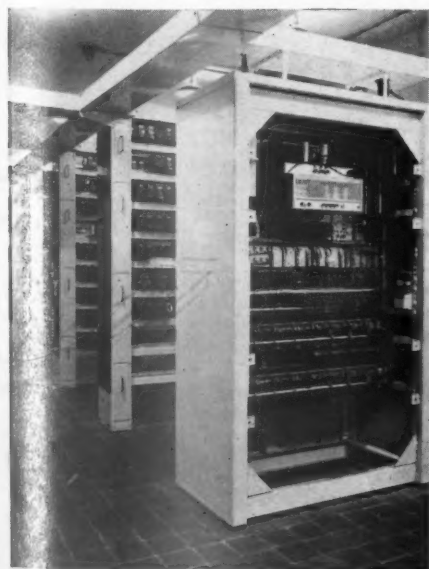
The remaining functions operated from the panel, e.g., detonator placers, ground-frame releases, individual point keys, and crank handle releases are controlled by thumb switches, those for point operation having a centre position.

Four lamp visuals are associated with each point key. Two of these display N or R according to the detection. A third lamp situated between and slightly above the detection lights shows the letter "F" when the points are free to be moved. The fourth lamp is below the point key and shows a flashing red light if detection is absent for appreciably more than the normal time required for the points to throw. This indicates lack of correspondence between the signalbox equipment and the points.

Relay Room at Harlow Town

In addition to the layout at Harlow Mill, the panel described above incorporates the track layout at Harlow Town. At the latter point, a relay room contains the interlocking and control equipment for the points and signals in the Harlow Town area.

Route-setting and independent operation of the various functions at this interlocking is effected from the Harlow Mill panel, through the medium of Westronic remote control. This is a time-division scanning system which sends out carrier frequency each time a control instruction is sent from the panel and every time a



(Left): general view of relay room at Harlow Mill signalbox; (right): remote control panel at Harlow Town



View from down island platform, looking toward London

change in any indication circuit occurs.

The Westronic equipment is contained in special cabinets in the relay rooms and uses a large number of printed circuit cards. An oscilloscope is built into each of the terminal equipments so that routine checking of the circuits can readily be carried out. The printed circuit cards plug in, thus speeding up the work of changing a card should this become necessary.

All the relays used in these installations are of the plug-in type. The greater number—including lock relays—are of latest miniaturised pattern or telephone type.

The signals are of the conventional searchlight type, the fourth aspect being added as required. The lamp in each searchlight signal is of the 12 V. 12/16 W. double-filament type—the 12 W. filament being normally in use.

A lamp-proving relay proves either the main filament alight and the auxiliary filament intact, or the auxiliary filament burning. Failure of either filament breaks the lamp-proving circuit which passes through all lamp-proving relays in series and causes an alarm to be given in the signalbox.

Provided the auxiliary filament remains burning the operation of the signalling is not affected, but should both filaments fail the signal in the rear cannot clear from red. Thus, steps can be taken to replace a bulb immediately either filament fails.

The point machines are of the 110 V. 50-cycle type and are controlled locally by d.c. polarised relays fixed close to the machine.

Local Power Source

Power for operating all signalling at both the main signalbox and the remote interlocking is obtained from the Chief Mechanical & Electrical Engineer's track-sectioning cabin and is 50-cycle single-phase at 650 V. This supply comes from local sources. Should it fail, operation of a contactor in the track-sectioning cabin reconnects the signalling mains to a 25,000/650 V. transformer fed from the

overhead line equipment. The signalman at Harlow Mill is given an indication every time a change-over of power supply takes place.

A new bridge on the west side of the station carries an important by-pass road over the railway. Specially constructed by British Railways for the County Authorities, it has enabled the former level crossing at this point to be closed.

The architect was Mr. H. H. Powell, B.Arch., F.R.I.B.A., Architect, Eastern Region. The design team were Messrs. Paul Hamilton, A.A.Dipl., A.R.I.B.A., John Bicknell, A.A.Dipl.(Hons.), A.R.I.B.A., and Ian Fraser. The Quantity Surveyors were Yeoman & Edwards; the Clerk of Works was Mr. G. Norris, and the main contractor was W. & C.

French Limited. The whole of the work was carried out under the general direction of Mr. A. K. Terris, B.Sc., M.I.C.E., Chief Civil Engineer, Eastern Region.

The signalling work was directed by Mr. R. A. Green, M.B.E., E.R.D., A.M.I.E.E., Signal Engineer, Eastern Region.

Sub-contractors were as follow:—

Signalling equipment	Westinghouse Brake & Signal Co. Ltd.
Piling...	Holmpress Piles Limited
Lifts ...	Wm. Wadsworth & Sons Ltd.
Public address	Easco Electrical (Holdings) Limited
Steelwork	Robert Stevenson (Structural) Limited
Plastering	G. H. Martin (Contractors) Limited
Painting	F. Labbett & Sons Ltd.
Tiling	Parkinsons (Wall Tiling) Limited
Glazing	Faulkner, Green & Co. Ltd.
Plumbing	Matthew Hall & Co. Ltd.
Windows	Henry Hope & Sons Ltd.
Stonework	J. Bysouth Limited
Mosaic	Proctor & Lavender Limited
Electrical work	Haines & Sheppard Limited
Asphalte	General Asphalte Co. Ltd.
Roofing	Cambridge Asphalte Co. Ltd.
Roller shutters	Haskins
Lightning conductors	J. W. Gray & Son Ltd.
Heating and gas installation	Norris Warming Co. Ltd.
Linoleum flooring	Raymond Leonards Limited
Parcel's yard gates	Bayliss, Jones & Bayliss Limited
Ticket office equipment...	Roneo Limited
Special timber beams	Gabriel Wade & English Limited
Ironmongery	Parker, Winder & Achurch Limited
Rooflights	Quicktho (1928) Limited
Paint	Smith & Walton Limited
Bricks	Proctor & Lavender Limited
Glazed tiles	Purbeck Decorative Tile Co. Ltd.
Plastic angle drips	U.A.M. Plastics Limited
Vitreous enamel signs	Mead, McLean & Co. Ltd.
Concourse train indication	Partington Advertising Co. Ltd.
Overhead line structures	Tubewrights Limited
Sanitary fittings	Stitsons Sanitary Fittings Limited
Illuminated sign	British Sign & Electrical Co. Ltd.
Applied lettering	Furneaux (Industrial Supplies) Limited
Furniture and fittings	Wm. Dibben & Sons Ltd.
Door mats	United London Workshops for the Blind (Sales) Limited
Ladders	H. C. Slingsby Limited
Staircase, balustrades, and ticket barrier	James Hill & Co. Ltd.
Transistorised clock	Communication Systems Limited



Waiting room on footbridge

Large Diesel-Hydraulic Works Locomotive

Ruston 275-b.h.p. 32-ton four-wheel shunter with three-stage torque converter and Paxman six-cylinder vee-form engine



Ruston LSSH diesel-hydraulic locomotive at work in an ironstone quarry

ONE of the outstanding characteristics of the locomotives produced by Ruston & Hornsby Limited of Lincoln is the relative ease with which dismantling can be carried out in private workshops for the purpose of heavy maintenance. This feature has been given special attention in the latest Ruston diesel shunting locomotive, the LSSH 275-b.h.p. model, which incorporates the Paxman 6RPHL six-cylinder vee-form engine and stepless transmission.

A Twin Disc CF.13800 three-stage hydro-kinetic torque converter incorporating a cut-off clutch transmits engine power via a Layrub cardan shaft to a Ruston reverse-reduction gearbox; from this the drive is taken by jackshaft carried in Timken bearings and coupling rods. Although, compared with a mechanical transmission with a number of selected gearbox speed ratios, the hydraulic transmission shows a somewhat reduced overall efficiency, a strong preference for the stepless type of drive has been expressed by operators who use shunting locomotives in the larger power range.

Full Use of Power

Apart from the transmission giving the obvious advantage of simplified control, more efficient utilisation of power is claimed because, within the designed speed range of the locomotive, the torque converter allows for the full power always to be available for propelling the load at a speed commensurate with the conditions of the haul.

With the LSSH locomotive in single-gear form the transmission gives an

overall efficiency of about 70 per cent in the main working-speed range of 5–10 m.p.h. Maximum starting tractive effort is 23,000 lb. At 2.1 m.p.h. the tractive effort is 17,920 lb. with adhesion 560 lb. per ton, and the drawbar pull 17,536 lb. thus giving quick acceleration and enabling a 396-ton load with a rolling resistance of 12 lb. per ton to be hauled up a gradient of 1 in 75, or 490 tons up 1 in 100. At 10 m.p.h. the tractive effort is 6,750 lb. (drawbar pull 6,366 lb.), and at the maximum speed of 16 m.p.h. it is 2,800 lb. (2,416 lb.). Two-speed gears can be incorporated in the reverse-reduction gearbox in which case the required overall ratio is selected when the locomotive is stationary.

Suitability for Most Gauges

The rail gauges for which the LSSH has been pre-engineered throughout the design stages are 4 ft. 8½ in. and 5 ft. 6 in. and the weight may be varied by the manufacturer at between 28 and 32 tons to meet operational requirements. A six-wheel version also is available suitable for metre to 5-ft. 6-in. gauge and weighing either 34 or 36 tons.

The main-frame parts are machined from steel plate and sequence welded to eliminate stresses during assembly. There are shunter's platforms at each side of the forward end.

The wheels have cast-steel centres with shrunk-on tyres and are pressed and keyed on to the axles. Suspension is by laminated steel leaf springs which are self-aligning without hangers. Side thrust of the wheels is taken by split thrust collars located between single-flange axleboxes and fitted with renewable running faces.

There are no thrust faces on the insides of the wheels. Axleboxes and hornguides are of cast steel with renewable manganese-steel liners; the bearings, which are of phosphor-bronze and replaceable from standard stock without individual fitting, are lubricated from a Wakefield oil pump. Spring-loaded axle pads are fed from excess oil in the keep. A bearing can be inspected and changed without lifting the locomotive other than to jack the weight off the spring. Coupling rods, profile burnt from steel plate, have grease-lubricated phosphor-bronze bearings.

All-Round Vision

The cab allows good vision in all directions and is equipped with drop windows, a hinged door on each side, and tip-up seats. Driver's controls are duplicated and grouped to two control positions, one at each side. A special feature to simplify gearbox removal is the arrangement whereby the 185-gal. welded-steel fuel tank together with its bonnet section behind the cab can be removed as a complete sub-assembly. The engine bonnet is constructed of steel plate secured to a rigid angle-iron structure from which all side panels are detachable.

Power control is by a single lever connected to the engine governor and to a valve which supplies air to the cylinder for operating the clutch in the torque converter. Other controls are the reversing lever which operates a pneumatic control to the gearbox, the Westinghouse air brake lever, and the sanding and whistle controls, all duplicated and grouped at each side of the cab. An interlock on the forward and reverse selection equipment prevents the lever being moved until the locomotive is at rest and, when already stationary, until there is sufficient air in the receivers for brake application purposes.

A single-stage Broom & Wade compressor is driven by belts from a pulley at the forward end of the engine crankshaft. Electrical equipment includes 24-V. lighting with an engine-driven dynamo to charge a lead-acid battery used also for starting the diesel engine. A headlamp and cab lamps are installed, also instrument lighting.

Resilient Engine Mountings

The Paxman 6RPHL vee-form six-cylinder diesel engine develops 275 b.h.p. at 1,360 r.p.m. and is mounted resiliently on rubber with welded-steel longitudinal restraining chocks. It has C.A.V. fuel-injection equipment and an Ardleigh servo-assisted hydraulic governor with overspeed shut-down device. A thermostat controls the flow of cooling water to the radiator. Warning buzzers and red indicator lights in the cab are operated in the event of the water or oil becoming overheated.

Automatic Routing of Electric Trains

Indentra train identification system on Philadelphia Transportation Company Broad Street Subway

(By a correspondent)

EXTENSIVE use of the Indentra identification system for automatic routing of trains is made by the Philadelphia Transportation Company on its Broad Street Subway line in Philadelphia. The system consists of a detachable, inert coil carried on the train, and of lineside coils and equipment.

The train coil is attached to the upper, right front of the train and includes a rotary switch and a capacitor box. The rotary switch allows nine different frequencies to be selected by changing the capacitance in the tuned circuit. This gives nine different train descriptions, the largest range of selections so far provided under the Indentra system. All trains on the Broad Street Subway carry one of these coils.

The lineside apparatus is composed of a location case containing apparatus and two coils. The coils are positioned one on top of the other, both in a vertical plane parallel to the track and 17 in. from the coil carried on the front of the train. These coils are connected to a specially designed amplifier circuit.

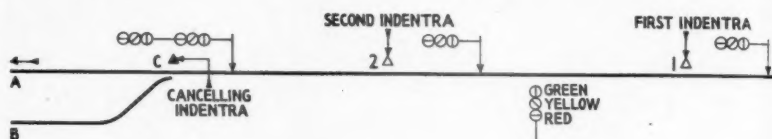
Operation of Lineside Equipment

When the train coil enters the magnetic field created by the lineside coils the mutual coupling causes the amplifier circuit to oscillate and through other circuits energises a control relay which operates the facing points, if they are required to be moved, and clears the appropriate signal. The lineside apparatus also has other tuned circuits which only respond to their own particular train coil, and are not responsive to coils of different frequencies.

At points of divergence where it is desired to identify a train, three sets of wayside equipment are provided, a first identification point, a second identification point and a cancelling point. The first identification point is placed far enough off from the points to ensure that switches have time to operate and signals

signal. It accepts any coil tuning to clear the Indentra equipment for the next train selection.

Should a wrong route be set up because of an incorrect setting of the selector switch on the train coil or a failure in the Indentra equipment, the motorman can change the position of points at each



At diverging point: the signal at the top refers to route A; the yellow aspect denotes the condition of the signal ahead

to clear to the least restrictive aspect possible. The second identification point is located nearer the home signal.

In heavy traffic, with close headways, a second train may arrive at the first Indentra point before the preceding train has cleared the cancelling point. In such instances provision is made for the motorman of the following train to clear the signal by operating a small lever mounted beneath it. This train, now travelling at low speed, selects its route at the second identification point.

It is claimed that this method is superior to storing identifications from the first location for more than one train, because it excludes the possibility of a fault in the storing system mis-routing a train. The cancelling location is immediately in advance of the home

turnout by operating a push-button for the desired route. A push-button and a white light for each route is mounted 11 ft. in advance of the home signal reading over the points. The motorman depresses the button corresponding to the desired route and the associated white light illuminates to indicate that the request for a change of route has been registered. The signal, which had been cleared for the incorrect route, changes to "stop".

A timing circuit comes into action which imposes a wait of about one minute. The points then change and the signal clears for the new route. The white indication over the push-button is extinguished as soon as the train occupies the next track circuit ahead. The rules also require that the motorman advise the train controller of the irregularity.

Express Diesel Multiple-Unit Trains

(Concluded from page 188)

carried between adjacent cars by means of four 19-point flexible jumper couplings. By the operation of one starting button all the engines on the left-hand side of the train can be started; a second button starts all those on the right-hand side. Indicator lights show when each engine has started and if an engine subsequently stops for any reason, the failure of one indicator light shows the exact position in the train. The operation of one button stops all the engines. Indicator lights are also provided to show when sufficient air pressure is available in each power car and that the final drives are correctly positioned for starting. The power-regulator lever incorporates the deadman's-handle feature which, when released, closes the throttle and also applies the brakes.

Other equipment on the control table comprises the gear-change control handle, vacuum-brake valve, and controls for the dual-note warning horns and windscreen wipers. A hand-brake wheel is fitted in

close proximity to the driver's seat and provision exists for the B.R. automatic warning system to be fitted. Instruments grouped together in an improved layout include gauges to indicate compressed-air pressure, high and low vacuum in the brake systems, train speed, and engine speed.

Intercommunication

Provision is made for two-way buzzer signals and also Loudaphone equipment is installed for communication between driver and guard.

An adjustable leather-padded driver's seat is provided and there is a specially positioned leather-padded arm rest. Warm air fed into the driver's compartment from the main heating system is regulated over a wide range of temperatures. A proportion of the warm air can be diverted on to the windscreen for demisting.

Graviner fire protection equipment, fitted above all the engines, automatically discharges chlorobromomethane from a spray tube on to the engine if the pyrotechnic cord which is mounted above it is subjected to excessive heat. Operation

of the fire-protection equipment shuts down the affected engine and rings a bell in the driver's compartment. The affected engine can be identified by the driver from the position of the extinguished indicator light. A warning light also appears at the side of the vehicle showing the location of the fire from track level.

The exteriors of the cars are painted green with cream linings and instead of the usual head-code lamps, accommodation is provided at the driving end of each powered car for a four-letter head-code indicator which can be illuminated.

Sub-contractors include the following:—

Traction equipment	...	British United Traction Limited
Air Heaters	...	S. Smith & Sons (England) Ltd.
Axleboxes	...	British Timken Division of the Timken Roller Bearing Company
Bodyside doors	...	Lightalloys Limited
Brake system	...	Gresham & Craven Limited
Fire protection equipment	...	Graviner Manufacturing Co. Ltd.
Seat frames	...	G. D. Peters & Co. Ltd.
Sliding shutter ventilators	...	Beckett, Laycock & Watkinson Limited

RAILWAY NEWS SECTION

PERSONAL

Mr. F. L. McCloskey has been appointed General Agent, Canadian Pacific Railway, in charge of all passenger services, following the retirement of Mr. J. E. Roach.

Mr. S. S. Ramasubban, formerly General Manager, North-Eastern Railway of India, who, as recorded in our June 24 issue, has been appointed General Manager, Western Railway, was born in 1907. In 1927 he

of the railways into larger zones. In 1951, on completion of his tenure of office, Mr. Ramasubban returned to the Central Railway as Divisional Superintendent, Jhansi. He was appointed Senior Deputy Manager of that system in May, 1953. Two months later he was transferred to the Western Railway as Senior Deputy General Manager and was associated with the organisational changes of that railway. He also played a leading part in the change-over from the district to divisional system of organisation

Mr. A. G. Collings has been appointed an Officer of the London Transport Executive with the title of Assistant Superintendent of Laboratories (Chemist) in the Office of the Director of Research.

Mr. U. G. Rao, Divisional Superintendent, Sealdah Division, Eastern Railway of India, who, as recorded in our April 15 issue, has been appointed Chief Engineer, Eastern Railway, was born on October 10, 1913. After taking his degree in Engineer-



Mr. S. S. Ramasubban
Appointed General Manager, Western
Railway of India



Mr. U. G. Rao
Appointed Chief Engineer, Eastern
Railway of India

graduated from the Presidency College at Madras, with Honours in Physics. He then spent two years as a research student in physics at Calcutta. Mr. Ramasubban joined the former Great Indian Peninsula Railway in 1930, and served at the Head Office, Bombay, and in the districts, both in Junior and Senior scales. He became Divisional Traffic Manager at Nagpur from 1941 to 1946, and was responsible for devising the coal allotment system to deal with distribution of coal wagons from Pench Valley and Chanda Valley coalfields. He was also closely concerned with the organisation of the road transport corporations at Nagpur. In 1946, he became Joint Director, Rail-Road, for the Railway Board and took part in the reorganisation of road transport in Uttar Pradesh. He was appointed Secretary of the Railway Board in September, 1947, and in this capacity he dealt with many major problems connected with partition, including the absorption of thousands of railwaymen from Western Pakistan. He was also in office during the reorganisation

and in the working of the Second Five-Year Plan. In August, 1958, he was appointed General Manager North-Eastern Railway. Just before his new appointment as General Manager, Western Railway, he was elected President of the Indian Railway Conference Association, on the retirement of Mr. M. K. Kaul.

B.T.C. APPOINTMENTS

The British Transport Commission has announced the following appointments:—Mr. L. J. Culshaw and Mr. J. F. T. Nangle, to be Auditors of the Accounts of the B.T.C. for the year ending December 31, 1960.

Mr. F. L. Hick, Assistant Operating Officer, North Eastern Region, has been appointed Operating Officer, North Eastern Region, York.

We regret to record the death of Mr. G. M. Wells, M.I.C.E., M.I.Mech.E., who was a partner in the firm of Messrs. Livesey & Henderson.

ing from Mysore, he joined the Indian Railway Service of Engineers in 1937, and was posted to the former Great Indian Peninsula Railway as a probationer. He became an Assistant Executive Engineer in April, 1939, and after a further seven years' service was promoted to be an Executive Engineer in May, 1946. During his time on the G.I.P., Mr. Rao held a number of construction and maintenance posts. He has also been sent by the Government of India to a number of European countries to attend conferences, visit research laboratories, and study tunnelling methods and works. Mr. Rao has published several books on technical subjects.

Mr. Derek Oliver Good, of the Pioneer Haulage Co. Ltd., has been elected Chairman, National Road Transport Federation Limited for the coming year. Mr. Good is one of the National Vice-Chairmen of the Road Haulage Association and has been an active member since 1947. He is also Chairman of the Devon & Cornwall area of the Association.



Mr. A. J. Ives

Appointed District Commercial Officer,
Doncaster, Eastern Region

Mr. A. J. Ives, Traffic Costing Officer, Great Northern Line, Kings Cross, who, as recorded in our June 17 issue, has been appointed District Commercial Officer, Doncaster, Eastern Region, was educated at Archbishop Holgate's Grammar School, York, and began his railway career with the former London & North Eastern Railway at York in 1936. In 1946, after war service, he returned to the railways and was appointed a Traffic Apprentice. He held positions in London and York before transferring, in 1951, to British Road Services as Commercial Assistant to the Divisional Traffic Officer, Midland Division. Two years later he moved to London to join the Costing Service, British Transport Commission, subsequently holding appointments as Assistant Traffic Costing Officer, Waterloo, Traffic Costing Officer, Liverpool Street, and Traffic Costing Officer, Great Northern Line, Kings Cross.

Mr. H. Darnell has been appointed a Director of the Workington Iron & Steel Company and Mr. D. R. Ward Jones has been appointed a Director of United Coke & Chemicals Co. Ltd.

Mr. G. M. Wilson, Sales & Development Assistant, Line Traffic Manager's office (Great Northern), Eastern Region, who, as recorded in our July 8 issue, has been appointed District Commercial Officer, Traffic Manager's Office, Kings Cross, was educated at University College School, London, and Christ's College, Cambridge. In 1934, he joined the former L.N.E.R. as a Traffic Apprentice, carrying out his training in the Scottish & North Eastern areas. After war service he resumed his railway career, and was appointed Assistant Goods Agent, Middlesbrough and, in 1946, Assistant to the District Goods Manager, Newcastle. The following year Mr. Wilson took up the duties of Assistant to the Locomotive Running Superintendent, North Eastern Area, York. In 1949, on completion of a course at the Administrative Staff College, Henley, he was appointed Assistant District Goods Manager, Leeds (Eastern & North Eastern Regions). A year later he was promoted to the Railway Executive as Assistant (Integration) to the Executive Officer (Road Transport). Following his appointment in 1951 to the position of Operating Officer Administration (Parcels), Mr. Wilson served for six years with British Road Services.



Mr. G. M. Wilson

Appointed District Commercial Officer, Traffic
Manager's Office, Kings Cross, E. Region

On the formation of B.R.S. (Parcels) Limited, he was appointed Assistant to the General Manager and, later, Area Manager for the South Western Area. In 1957 he rejoined the railways as Sales & Development Assistant, Line Traffic Manager's office (Great Northern), Eastern Region.

We regret to record the death of Mr. W. McKie, former Stores Superintendent, Eastern & North Eastern Regions, who retired from that position 10 months ago. Mr. McKie was educated at Kilmarnock Academy, and entered the service of the former G.S.W.R. in 1913. During the 1914-18 war he served with the Royal Field Artillery, and on demobilisation returned to the service of the G.S.W.R. Mr. McKie later became General Assistant to the Stores Superintendent, Northern Division, L.M.S.R., in which capacity he was largely responsible for the extensive reorganisation of the Stores Department in Scotland. He was subsequently appointed Divisional Storekeeper for the Northern Division of the L.M.S.R.



The late Mr. W. McKie

Stores Superintendent, Eastern & North
Eastern Regions, 1951-59



The late Mr. H. E. B. Cavanagh

Architect, Civil Engineer's Office,
Western Region, 1949-60

at Glasgow, and in 1949 became Assistant Stores Officer, Scottish Region. In March, 1950, Mr. McKie was seconded to the Eastern & North Eastern Regions to assist in the reorganisation of main workshop stores, and was appointed Stores Superintendent of both Regions a year later, the appointment from which he retired in 1959.

We regret to record the death of Mr. H. E. B. Cavanagh, A.R.I.B.A., A.A.Dip., Architect, Civil Engineer's Office, Western Region, who was drowned in a yachting accident on August 3. Mr. Cavanagh was in his fifty-first year. He received his professional training at the Architectural Association between 1925 and 1930. After varied experience as an assistant in the offices of a number of architects, he was in private practice until the outbreak of war in 1939. He joined the staff of the Architect, Great Western Railway, in November, 1945, after demobilisation from the Army, in which he served with the City of London Yeomanry, the King's Regiment, and later overseas with the Parachute Battalion of the Royal Welch Fusiliers. Mr. Cavanagh became Assistant to the Architect, Great Western Railway, in April, 1946, and was appointed Assistant Architect in September, 1947. He was promoted to be Architect, Civil Engineer's Office, Western Region, in 1949.

We regret to record the death of Lt.-Colonel H. C. Prescott, C.M.G., C.I.E., former Chief of Police of the Southern Railway. Lt.-Colonel Prescott was born in 1882, and educated at Bedford Modern School. He was commissioned in the Indian Army, from which he retired in 1928, with the rank of Lt.-Colonel. He served in South Africa, 1901-2, in the British Army, and he gained the Queen's Medal with five clasps. During the 1914-18 war, in Mesopotamia and Iraq, he was awarded one clasp, was mentioned twice in despatches, and made a C.I.E. While in the Indian Army he was appointed Inspector-General of Police, Iraq, and raised a force of 10,000 officers and men. He retired from this appointment in 1927, and joined the Southern Railway as Chief of Police in 1936. He retired from railway service in 1947. Colonel Prescott was made a Commander of the Order of St. Michael and St. George in 1926, and he was a member of the Order of Al Rafidain (Iraq), 2nd Class.



The late Mr. W. A. Worth

Recently appointed Purchasing Officer,
London Transport Executive



Mr. C. W. Evans

President of the National Union of
Railwaymen, 1958-60



Mr. W. H. Rathbone

Elected President of the National Union
of Railwaymen

We regret to record the sudden death of Mr. W. A. Worth, Purchasing Officer, London Transport Executive, who, as recorded in our July 15 issue, was recently appointed an Officer of the Executive. He was born in 1901, and joined the Engineer's Department of the London General Omnibus Company in January, 1915. He transferred to the Purchasing Department in 1920. After five years as Senior Assistant to the Purchasing Officer, he was appointed Assistant to the Chief Supplies Officer, with the rank of Principal Executive Assistant. In July, 1954. In March, 1956, he was appointed Principal Purchasing Assistant and returned to the Purchasing Office, where he was in control of general commodity buying.

TRANSPORT USERS' CONSULTATIVE COMMITTEE, SCOTLAND

The following have been appointed to be members of the new Transport Users' Consultative Committee for Scotland until July 31, 1963:

Chairman
Sir John G. Banks.

Members

Mr. A. C. Barr and Mr. W. B. Swan, representing agriculture; Mr. W. Mackenzie, Mr. A. V. McLeod, *Mr. J. C. Williamson, Mr. J. F. Carnegie, Mr. H. Adamson and *Mr. A. Prentice, representing industry & commerce; Mr. J. Urquhart, representing shipping; Mr. W. Mowbray and Mr. E. W. Craig, representing labour; *Councillor Mrs. C. B. M. Filsell, *Councillor J. Bennett, the Rev. P. Craik MacQuoid, Mr. F. W. Walker, *Mr. A. C. Smyth, *Provost R. Wotherspoon and *Provost J. Sinclair, representing Local Authorities; Colonel Donald Cameron of Lochiel, Mr. J. P. Young, Mr. J. Ness and Mr. J. Amos, representing the British Transport Commission; Mrs. M. J. Macdonald and Miss A. McKenzie, Additional Members.

* indicates new members.

C.N.R. APPOINTMENTS

The Canadian National Railways has announced the following appointments:—Mr. S. F. Dingle, Vice-President of Operation to be system Vice-President; Mr. A. H. Hart, Vice-President of Traffic to be Vice-President of Sales; Mr. H. C. Grayston, Assistant Vice-President of Operation to be Vice-President of Transportation & Maintenance.

Mr. C. W. Evans, who, as recorded in our July 29 issue, has retired from the office of President, National Union of Railwaymen, is 54. He is a checker at Kings Cross Goods Yard, Eastern Region, British Railways, and has been a member of the N.U.R. executive for two years, and a Branch Secretary for 16 years. He has been a member of the Labour Party for 31 years and is a former member of the Islington Borough Council. Mr. Evans was awarded the British Empire Medal in 1946 in recognition of his services to fellow workers. He has been President of the N.U.R. since March, 1958.

WORSHIPFUL COMPANY OF CARMEN

The following elections for the ensuing year have been announced by the Worshipful Company of Carmen:

Master

Mr. R. W. Birch.

Senior Warden

Alderman Sir Frederick M. Wells.

Junior Warden

Mr. F. Cumber.

Mr. H. H. Talboys has been appointed Consulting Vice-President, Railway Equipment Division, Nordberg Manufacturing Co. Ltd., and Mr. W. B. Blix has been appointed Vice-President of the Division.

Mr. Peter Thorneycroft, Minister of Aviation, and Mr. W. L. Smith have resigned from the board of Pirelli-General Cable Works Limited.

Mr. G. E. Smith, Director of Production for the Perkins Group, has been appointed Assistant Managing Director of Hamworthy Engineering Co. Ltd.

Mr. W. W. Hackett has retired from the Chairmanship of Accles & Pollock Limited and has been appointed its first President. Mr. Hackett was a founder member of Accles & Pollock Limited and of its parent, Tube Investments Limited.

Mr. W. L. Cardy has been elected Chairman, Associated Automatic Machine Corporation Limited, and the British Automatic Company, its subsidiary. He replaces Mr. B. M. Till, who resigned from the Board and from the corporation's subsidiaries last year. Mr. Cardy will continue as Managing Director of Associated Automatic Limited.

Mr. W. H. Rathbone, who, as recorded in our July 29 issue, has been elected President of the National Union of Railwaymen for 1961, is a ganger employed in the Permanentway Department, Manchester, L.M. Region. He joined the union in 1924, and has served on the National Executive Committee for three terms of three years, the last being 1957-59. He has been Chairman & Secretary of the Union's negotiating committee, and a member of the Railway Shopmen's National Council and the National Railway Electrical Council. He is President of the Permanentway, Signal & Telegraph Grades National Conference, and has also been President of the Manchester & District Council and the Midland & North-Western Co-ordinating Committee of District Councils. He has been Chairman of his branch for 25 years. Mr. Rathbone was one of eight trade union representatives on the Committee set up to advise on the conduct of the Guillebaud pay inquiry.

Mr. O. O. Gresler, Managing Director of G. Stephenson & Co. Ltd., whose death was recorded in our August 12 issue, was educated at Uppingham and began his career with Taylor Bros. & Co. Ltd. at Trafford Park Steel Works, Manchester. He joined the Metropolitan-Cammell Carriage & Wagon Co. Ltd. in 1900, and G. Stephenson & Co. Ltd. in 1935. He was elected a Director of the company in 1939, and Managing Director in 1955.

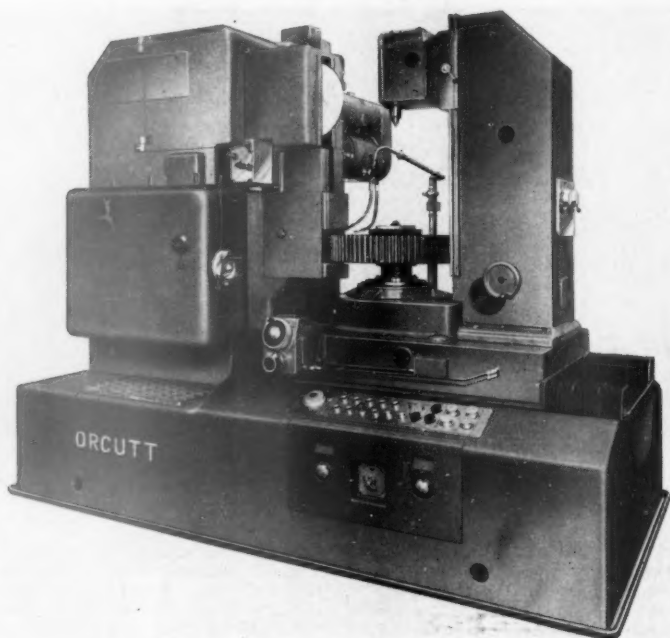
Sir Geoffrey Crowther has been made a Director of the British Aluminium Co. Ltd.

Mr. L. A. Armstrong has been appointed Chief Designer, K.D.G. Instruments Limited.

Mr. J. E. H. Davies and Mr. C. H. W. Smith, General Managers of the Markets Department and Supply & Development Department respectively, have been appointed Directors of BP Trading Limited.

Mr. L. M. Broadway, Deputy Chairman & Managing Director of Castrol Limited, has been elected Chairman of Metal Cleaning Limited, and Mr. J. A. V. Watson, has been elected Deputy Chairman. Mr. S. H. Oliver has been appointed Manager of the Purchasing Department of Castrol Limited, in succession to the late A. J. Stafford.

NEW EQUIPMENT AND PROCESSES



Gear-Grinding Machine

THE GC 48 gear-grinding machine has been developed to meet the trend to increase the face-width of diesel traction gears and to use a much coarser pitch, and to accommodate the larger components in the machine tool industry.

This machine can grind gears of up to 48 in. dia. x 12 in. face-width and to a pitch of 1.75D.P. Additionally, large pinion shafts can be ground between the centres of a detachable tail stock attachment. Maximum dia. of the centre-mounted gears is 28 in.

Long shaft components can be located through the hollow work spindle. Maximum shaft diameter accommodated is 6 in.

Full use has been made of the improvements embodied in the manufacturer's internal helical gear-grinding machine. The indexing mechanism operates on the same principle, and the entire hydraulic system is separate from the machine. Stein & Atkinson Vickers equipment is used.

Although the control panel enables complete machine operation to be controlled from one central position, necessary dupli-

cation can be effected for operating certain units from the rear of the machine.

The trimmer unit is of the 1:1 form type. Two hardened and ground form-plates shaped to the profile required on the gear-teeth control the path of the diamond tools over the grinding wheel. The root form is taken care of by a trimmer in which a central diamond is traversed over the complete fillet of the tooth, covering both radii and a flat if required. The radial setting dimension, arc of swing to join to the involute curve, and the width of flat are all controlled by limit switches and micrometer stops.

Further details can be obtained from the manufacturer, the Gear Grinding Co. Ltd., Shirley, Solihull, Warwickshire.

Wedge-Belt Drives

FENNER Spacesaver wedge-belt drives are designed to transmit up to three times the horsepower of conventional vee-belt drives occupying the same space or the same horsepower in a considerably reduced

space. Both the metal and fabric components are manufactured by one company.

The basic improvement is in the materials and construction of the belt itself shown in the left-hand illustration below. Man-made polyester fibres of exceptional tensile strength are used for the load-bearing cords. These are bonded to synthetic rubber moulded in a new section profile with bridge-shaped base and crowned top. It is claimed that there is no loss of belt-life with 50 per cent reduction of area. The rubber is resistant to heat and oil; it has satisfactory electrical conductivity to enable it to deal with normal static hazards.

As will be seen from the centre and right-hand illustrations the slimmer belts need narrower grooves so reducing the face-width of pulleys; their flexibility allows smaller diameter pulleys with shorter centres to be used. All these factors reduce both the weight and the cost of each drive and also make belt replacement cheaper.

Spacesaver pulleys are specially designed high-grade castings which allow belt speeds of up to 6,000 ft. per min. to be specified leading to the possibility of using electric motors of higher speeds than hitherto and consequently further saving in cost. They are all made with interchangeable Taper-Lock bushes which combine the advantages of a shrunk-on fit with ease of fixing and removal.

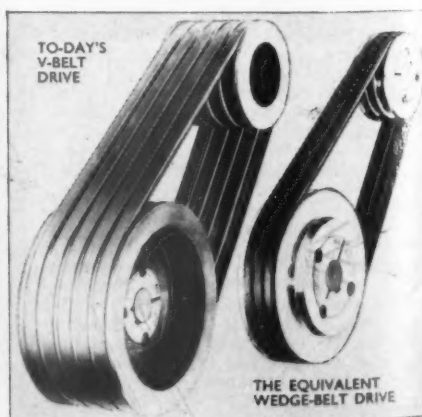
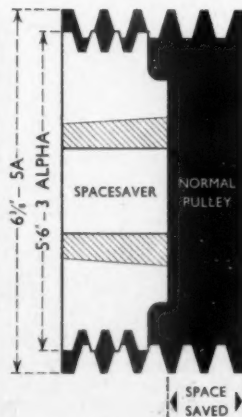
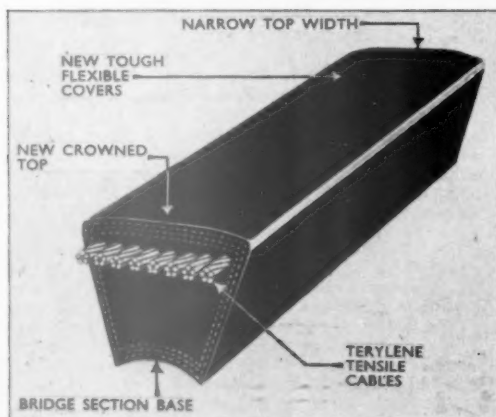
Pulleys in the Alpha series with from one to six grooves using Alpha wedge belt ($\frac{3}{8}$ -in. top width), are intended for drives of up to 50 h.p. The Beta series with from three to six grooves for Beta wedge belt ($\frac{3}{4}$ -in. top width), are for up to 200 h.p. A further series for 1-in. top-width belt will be in production shortly.

Further details may be obtained from the manufacturer, J. H. Fenner & Co. Ltd., Hull, or from any of its 20 branches throughout Britain where full stocks will be available from September 1.

Floating Suction Strainer

DOLPHIN floating suction strainers of plastics and stainless-steel construction for use in de-watering mines and emptying sumps, as described in our March 6, 1959, issue, are now available in a larger size suitable for use with 6 in. hose. The new version is intended for a wide variety of industrial uses such as cooling-water intakes from rivers and open reservoirs.

Further details may be obtained from Megator Pumps & Compressors Limited, 43, Berkeley Square, London, W.1.



Esso Technical Sales Research Building

Petroleum products research work carried out under most modern conditions

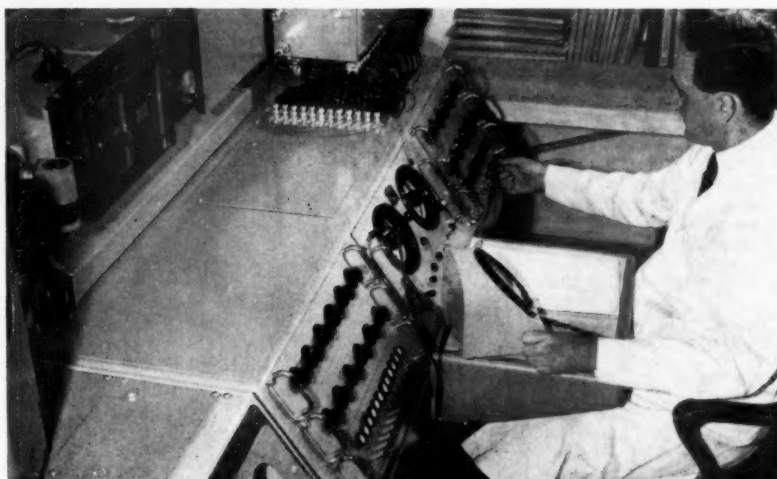
Technical service to the marketing department of the Esso Petroleum Co. Ltd., and to all users in Britain of the products of the company, is given by the Technical Sales Department, an organisation which has recently moved from rather cramped accommodation in Vauxhall, London, where it was situated for some 25 years, to new headquarters at Feltham, Middlesex.

For the work of the department to embrace all technical aspects of marketing, to safeguard and improve product quality, and to ensure that the majority of the petroleum requirements of industry are fully met the headquarters building includes comprehensively equipped mechanical and chemical laboratories staffed by experts in many different technologies. An existing building at Faggs Road, Feltham, has been adapted by re-modelling of the interior and by the addition of a new engine test house. Much of the work carried out takes the form of liaison between the main research laboratories of the company which determine the kind of product best suited to each application, and the refineries which decide how they should be made. Testing of the product to ensure that it meets the resultant specification includes carefully documented road and rail tests which may continue for a year or more.

Lubricant Samples Analysed

Currently the most prominent needs of railway organisations for service of the kind performed by the Technical Sales Department are those shared with the diesel engine manufacturing industry for investigation into any malfunctioning which might be attributed to either the fuel or lubricating oil. An

example of the more elaborate type of plant with which the laboratories are equipped is the Hilger & Watts 22-element direct-reading emission spectrograph for detecting any metal contaminant and some non-



Taking direct analysis readings from the emission spectrograph of the Esso Petroleum Co. Ltd., Technical Sales Department Laboratories, Feltham

metals present in either solid or liquid samples. Thus during the examination of used engine oil, by comparison with previous analyses, the condition of some of the

wearing parts of the engine can be deduced. The spectrograph can also be used to measure the additive content of unused oils, and for rapid qualitative and semi-quantitative analyses of sludges, powders, deposits, and aqueous solutions.

The mechanical laboratories include an engine laboratory, mechanical test rigs, and a boiler laboratory. The main sub-division of the chemical laboratories are a fuels section and a lubricants section. Additional petro-

leum products studied are oils for transmission units, electrical transformers, and machine cutting, greases for heavily-loaded bearings, and varieties of bitumen.

New Tug for Newhaven

Southern Region supplies tug for railway and civic use

A new tug for the port of Newhaven, fitted with radar and latest equipment for towing, salvage, and fire-fighting duties, which was launched at Appledore, North Devon, last February, is now in service.

Named the *Meeching*—the old name for Newhaven—the tug has been provided by the Southern Region of British Railways for its own and civic use.

The tug was ordered from Seawork Limited, and built by P. K. Harris & Sons Ltd. She replaces two existing tugs and performs seagoing as well as harbour duties.

Lister-Blackstone Engines

With accommodation for a crew of eight, she is driven by two Lister-Blackstone main engines operating through Modern Wheel Drive oil-operated reverse-reduction gears. The engines are continuously rated to give 660 b.h.p. at 750 r.p.m. Gearbox ratio is 2:1.

A bollard pull of 14 tons can be obtained with each engine developing not more than 500 s.h.p. when operating at the continuously rated torque and reduced revolutions.

Free-running, the vessel attains 12 k. when each engine develops a maximum of 500 s.h.p. in association with 750 r.p.m. or under. Bollard pull and speed at the above powers are both obtained when the vessel is in seagoing trim and displacement.

Electric-hydraulic steering operates twin rudders, and the steering control is by Telemotor. Auxiliary machinery includes two

Lister diesel engines, each driving a 30-kW. generator, a compressor, and a salvage pump. A further Lister diesel engine drives a 5-kW. generator for harbour duties. Electrical supply is 220 V. d.c.

Each of the two self-priming centrifugal Hamworthy salvage pumps has an output of 220 tons an hour against a total head of 140 ft. when running at 1,500 r.p.m. The pumps are arranged in parallel for salvage and in series for fire fighting—a Universal fire monitor on the wheelhouse provides a pressure of 180 ft. with a delivery of 200 tons an hour.

Engine exhaust is carried up the after legs of the tripod mast, which replaces a funnel in conformity with modern tug design, and disperses to atmosphere through louvres just before joining the main leg. The wheelhouse provides an all-round view.

Life-Saving Equipment

Complying with Ministry of Transport requirements, life-saving appliances include one fibreglass lifeboat, one 12-man inflatable liferaft in fibreglass container, and one section of buoyant apparatus. There is also rocket line-throwing apparatus.

Communication and navigational equipment includes wireless telegraphy, v.h.f. radio telephony, echo-sounder, and radar.

Maximum efficiency and manoeuvrability is obtained with twin screws, twin rudders, and bridge control.

Hull, machinery, and equipment are to the

special survey of Lloyd's Register of Shipping Class +100 A.1 "For Towing Services." The specification calling for scantlings in some cases is in excess of Lloyd's.

The all-welded steel construction on the Hydroconic form evolved and patented by Burness, Corbett & Partners Limited was adopted to reduce building and repair costs.

Principal characteristics are as follow :—

Particulars	ft. in.
Length overall	96 6
Length b.p.	88 0
Breadth moulded	25 0
Depth moulded amidships	12 0
Rake of keel	2 6
Draft aft for seagoing duties	11 3
Maximum draft aft for harbour duties	10 0
Gross registered tonnage is 170	

RAILWAY ARTISTS.—Seven hundred works from 15 countries were exhibited at the Fifth Railway Workers International Art Exhibition, held in Budapest at the beginning of August.

LAMBETH NORTH STATION REBUILDING PLANS.—Negotiations are going ahead for rebuilding Lambeth North Underground Station, London Transport Executive. As part of the re-development of this area it is proposed to rebuild the station entirely, incorporating it with a new office block. Application for planning permission has been received by the London County Council, but it will be some months before full details are announced.

Marshalling Yard for Lamesley

A marshalling yard is to be constructed at Lamesley, near Gateshead, in the North Eastern Region of British Railways. Covering 100 acres, it will replace nine existing yards and will serve the whole of Tyneside. Concentration of operation with resultant minimisation of intermediate staging of traffic between yards will halve daily wagon movements in the area from 6,500 to 3,500, cut costs, and improve service throughout the North East.

Operations will be console-controlled from a central tower overlooking a hump from which wagons will gravitate into 48 sidings equipped with electronically-governed retarders.

A field-induction radio network will link yard locomotives with the tower and a "talk-back" loudspeaker system will serve all parts of the yard.

A power-operated signalbox in the tower will replace 11 existing boxes to control an area extending from Durham to Gateshead.

Southbound trains will leave the yard by flyover to avoid other traffic, and there will be provision for the later erection of an overbridge to carry the proposed Newcastle-Gateshead by-pass road across the north end of the site.

Diversion of River Team

Main preliminary stages will include the diversion of the East Coast main line and of the River Team into a new course, and the construction of a new road across the site. Altogether, 11 new bridges will be built, and eight overhead power lines and two underground cables are being re-positioned. Work has already begun on the new bridges—the whole project is expected to be complete in 1962-63.

A start has also been made on filling. For this purpose, some $\frac{1}{2}$ million cu. yd. of earth spoil from a new cutting under construction at Corbridge, 20 miles distant, is being railed in special trains to Lamesley.

The Corbridge cutting replaces a tunnel constructed in the sandy soil by Robert Stephenson in 1835 and later widened to accommodate double tracks. This cutting will incorporate improved curves and permit



Work in progress on Corbridge Cutting, from which spoil is being taken to fill Lamesley marshalling yard, 20 miles distant

the speed restriction at present imposed on this section of the Newcastle-Carlisle line to be raised from 45 to 85 m.p.h.

G.E.C. Branch Reorganisation

The Engineering Group of the General Electric Co. Ltd. has announced that it has reorganised its representation at the company's branches in Great Britain under five Area Chief Engineers. This has been done so that the four areas in England and Wales shall conform more closely to those of the Central Electricity Generating Board's Generating Divisions and Area Boards. The territories covered by the South of Scotland Electricity Board and the North of Scotland Hydro-electric Board will remain the responsibility of the Scottish Area Chief Engineer.

The Area Chief Engineers and the areas they cover are as follow:

London, Eastern and Southern England: Mr. E. W. Molesworth, Magnet House, Kingsway, London, W.C.2., representing Central London, North London, South

London, Ipswich, Southampton and Bristol branches.

Scotland: Mr. J. R. Mercer, Magnet House, Waterloo Street, Glasgow, representing Glasgow and Edinburgh branches.

Yorkshire and the North East: Mr. V. F. Ellison, Magnet House, Gallowgate, Newcastle-on-Tyne, 1, representing Leeds, Sheffield, Hull, Newcastle and Middlesbrough branches.

North Western and North Wales: Mr. O. S. Chalmers, Magnet House, Victoria Bridge, Manchester 3, representing Manchester, Liverpool and Preston branches.

Midlands and South Wales: Mr. W. R. Greves, Magnet House, Newhall Street, Birmingham, representing Birmingham, Nottingham, Leicester, Stoke, Gloucester, Cardiff and Swansea branches.

Staff and Labour Matters

London Transport Rail Staff

London Transport underground workers and clerical staffs—about 18,000 are involved—are to receive a £750,000 a year pay increase backdated to January 4.

These pay increases are in line with those granted recently to salaried and conciliation staff on British Railways. Those too were backdated to January 4.

London Transport Power Stations

London Transport power station strikers at London Road, Chelsea, have rejected a back-to-work proposal by their unions and voted to continue their unofficial strike.

Tube and trolleybus services so far have been unaffected by the strike, which began on August 2.

British Transport Dock Staff

Pay increases for dock staff employed in the Docks Division of the British Transport Commission were agreed in negotiations with the three railway unions on August 9. The increases, which are backdated to January 4, 1960, are in line with those granted to British Railways staff under the terms of the Guillebaud report.

KEITH BLACKMAN LIMITED RESULTS.—The Chairman & Managing Director of Keith Blackman Limited, Mr. D. S. Woodley, states that during the year ended March 31, 1960, the value of orders received exceeded that of the previous 12 months, and the improvement is being maintained. The dividend will be 17½ per cent.

Tyne-Tees to London Overnight Goods Service



The "Kings Cross Freighter," Eastern and North Eastern Regions, British Railways, hauled by a Class "4" English Electric diesel locomotive (see our August 5 issue)

Contracts and Tenders

Diesel-hydraulic multiple-unit trains for the Guinea Railways

Guinea Railways has placed an order with Maschinenfabrik Augsburg-Nürnberg A.G., for six metre-gauge three-car diesel-hydraulic multiple-unit trains. The two motor coaches contain the power and baggage compartments and the second class saloons. The first class saloon, restaurant & kitchen, and bar are in the intermediate trailer. The set is equipped with a public address system for music and announcements. The company is also constructing for the President of the Republic of Guinea, a saloon which can be made up in the diesel trains.

Matisa Equipment Limited has received a contract from the Victorian Railways for one Matisa B.37 tamper and associated equipment for use on the Melbourne-Albury standard-gauge scheme. The value of the contract is in excess of £13,000.

British Railways, Eastern Region, has placed the following contracts:

Thomas Fletcher & Co. Ltd.: repairs to overbridge No. 124, between Killamarsh West and Woodhouse Mill

Strachan & Henshaw Limited: supply, delivery, and erection of wagon turntipper, haulage winch and discharge chute at Keadby Jetty

Holliday & Greenwood Limited: construction of workshop and staff amenity building at Colchester Diesel Depot

W. & C. French Limited: reconstruction of underline bridge No. 81 over the Great Northern main line between Tuxford Central and Fledborough

George Wimpey & Co. Ltd.: construction of inspection pits, manufacture, laying and fixing of pre-cast concrete deck slabs, elevated walkways, services, and so on, and construction of ducts, apron and roadway at new carriage servicing depot, East Ham

David Chaston Limited: provision of earthworks, construction of coal stacking area, road and paths, services, fencings, and so on, and strengthening for new track over culverts at Harlow Mill Station

James Scott & Co. (Electrical Engineers) Ltd.: supply, delivery and erection of electrical installations at Tilbury (Riverside) and East Tilbury Stations

Haymills (Contractors) Limited: station improvements at Billericay, Wickford, Rayleigh, Hockley, Rochford, and Prittlewell Stations.

British Railways, Southern Region, has placed the following contracts:—

Aubrey Watson Limited: resurfacing and surface dressing of roads, London (Western) District

John Mowlem & Co. Ltd.: new car ferry slipway, Fishbourne, Isle of Wight

Maurice Hill Limited: station renovations, Warminster

James Drewitt & Son, Ltd.: repairs and improvements, Bournemouth Central Station

W. R. Payne & Sons, Ltd.: renovations, Gillingham Carriage Depot

Caffin & Co. Ltd.: renovations, Eastleigh Carriage & Wagon Depot

B.K.S. Air Survey Limited: aerial survey, New Cross-Lewisham Area

Hunting Surveys Limited: aerial survey, Salisbury-West Moors-Redbridge Area

Fairey Air Surveys Limited: aerial survey, Salisbury-Brookwood-Amesbury Area

John W. Ridge Limited: improvements to staff accommodation, Newhaven Town Station

Stephens & Son Ltd.: improved staff accommodation, Exeter Central

John Laing & Son Ltd.: reconstruction, Folkestone Central Station

Maurice Hill Limited: recladding of repair shop, Slade green, and renewal of cladding, Eastleigh Locomotive Depot.

British Railways, North Eastern Region, has placed the following contracts:

Intermit Limited: supply of heavy-duty filter washing and oiling equipment for use in connection with the maintenance of main-line diesel locomotives at Holbeck Motive Power Depot, Leeds.

Hilmor Limited: motorised pipe bending machine for York Carriage Works

G. Stephenson (Builders & Contractors) Limited: concreting of the area outside the timber store at Shildon Wagon Works

S. Maclean & Son Ltd.: alterations to the ventilation installation in the Brass Foundry at North Road Works, Darlington

J. W. Mitchell & Sons Ltd.: surfacing of the stacking area for traders' coal at Halifax North Bridge Goods Depot

L. C. Abdale Limited: renewal of one of the platforms at Ormesby Station, near Middlesbrough

F. & J. Watkinson: installation of a weighbridge in Church Street Goods Yard, Halifax

Stephenson Developments (Huddersfield) Limited: one-storey prefabricated timber building as an extension to the Chief Civil Engineer's Bridge Office, York.

The Export Services Branch, Board of Trade, has received calls for tenders as follows:—

From Western Australia:

5 diesel-hydraulic shunting locomotives in accordance with W.A.G.R. specification No. 1186 of June, 1960.

The issuing authority and address to which bids should be sent is the Chairman, Western Australian Government Tender Board, 74 Murray Street, Perth. The tender No. is 507A/1960. The closing date is October 20, 1960. Tender documents can be obtained from the Agent-General for Western Australia, 115 Strand, London, W.C.2. The Board of Trade reference is ESB/20350/60.

From Chile:

4 breakdown trains, two for 5-ft. 6-in. gauge and two for metre gauge.

The issuing authority and address to which bids should be sent is La Empresa de los Ferrocarriles del Estado de Chile, Alameda Bernardo O'Higgins 924, Santiago. The closing date is September 5, 1960. The Board of Trade reference is ESB/19655/60.

From South Africa:

1 three-channel carrier system to S.A.R. specification Comm. 1601/58

1 voice-frequency telegraph system to S.A.R. specification Comm. 1601/58

5 rural carrier systems to S.A.R. specification ENW. 544/59

50 tee-on filters to S.A.R. specification Comm. 1454/58.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No.

C8299: Communication Equipment," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is September 2, 1960. Local representation is essential. For this purpose *Domicilium citandi et executandi* in the U.K. is not acceptable to the Union Government and the name of an accredited agent in the Union, appointed to act for the contractors, must be given. The Board of Trade reference is ESB/20148/60.

Argentina:

15,452 axles for locomotives, coaches, and wagons.

The issuing authority is the Argentine State Railways Administration. The tender No. is 18/60. The closing date is September 5, 1960. Further details and tender forms can be obtained on payment of 500 pesos from the Tender Section, Railways Administration, Av. Corrientes 389, Buenos Aires. The Board of Trade reference is ESB/20391/60. No further information is available at the Board of Trade.

From Pakistan:

An unspecified quantity of copper and steel plates for steam locomotives.

The issuing authority and address to which bids should be sent is the Chief Controller of Stores, N.W. Railways, Empress Road, Lahore. The tender No. is 210-S/4/P.VII (PIL). The closing date is August 25, 1960. Tender documents can be obtained from the above address at a cost of Rs.5 plus Rs.7 towards the cost of drawings and specifications. The Board of Trade reference is ESB/20109/60. No further information is available from the Board of Trade.

From Formosa:

13 items of tools and equipment, including hydraulic jacks and presses, arc welders, lathes, and drilling machines.

The issuing authority and address to which bids should be sent is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan (Formosa). The tender No. is CP4A-474. The closing date is September 5, 1960. The Board of Trade reference is ESB/19841/60/ICA.

From Thailand:

140,000 electrodes for general purpose, size ϕ 4 mm. No. 8.

The issuing authority is the State Railways of Thailand. The tender No. is 03277. The closing date is August 15, 1960. Tenderers should state brand name or send sample for consideration. The Board of Trade reference is ESB/20302/60. No further information is available at the Board of Trade.

300 wheel tyres as per drawing No. S1-2048/1

100 wheel tyres as per drawing No. 380 S1-2067/1

300 wheel tyres as per drawing No. 501 D1-2002/1

4,000 wheel tyres as per drawing No. LV1-2004/1.

The issuing authority is the State Railways of Thailand. The tender No. is 03272. The closing date is September 1, 1960. A deposit of Bht. 80,000 is required. The Board of Trade reference is ESB/20301/60.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

Notes and News

Rhodesia Railways Institute of Transport Examination Results.—In the 1960 Institute of Transport Examinations, Rhodesia Railways had 12 successful candidates as Associate Members, and 31 as Graduates.

Mines Units in Australia.—A. E. Goodwin Limited, of Auburn, N.S.W., builders of large diesel-electric locomotives for Australian railways, has signed an agreement with the Jeffrey Manufacturing Co., U.S.A., for the manufacture under licence of electric trolley and electric battery locomotives for mines, and also other mining machinery.

Agreement between P. B. Cow and B.I.C.C.—P. B. Cow & Co. Ltd. announces that negotiations with British Insulated Callenders Cables Limited have been concluded and the company has acquired certain assets belonging to the B.I.C.C. subsidiary, the St. Helens Cable & Rubber Co. Ltd. These assets include a factory at Slough, the goodwill of the St. Helens industrial rubber trade, and rubber manufacturing plant.

Section of Former L.B.S.C.R. Branch Re-opened.—The 4½-mile stretch between Horsted Keynes and Sheffield Park of the former London Brighton & South Coast Railway line from Horsted Keynes to Culver Junction, near Lewes, Sussex, was re-opened officially on August 7. The line, known recently as the Bluebell Line, and opened in 1882, was closed two years ago by the Southern Region, British Railways, because it was incurring a heavy loss. Part of it has been leased by the Bluebell Line Preservation Society, which has repaired the track, re-opened Sheffield Park Station, and acquired two locomotives and rolling stock to operate services at weekends. The re-opening ceremony was performed by Captain Anthony Kimmins, R.N. (ret'd.). Closure by the Southern Region was opposed by local residents. As a result of the discovery in the original Bill of a clause which enjoined a minimum service in perpetuity,

British Railways was compelled to run four trains a day until legal arrangements could be made for closure.

Road & Rail Association Pamphlets on Transport.—The price of the two pamphlets "Britain's Transport Crisis" with the subtitles "A Conservative's View," by Mr. Geoffrey Wilson, M.P., and "A Socialist's View," by Mr. Ernest Davies, is 1s. each, and not 2s. 6d., as stated in error on page 153 of our August 5 issue. They are obtainable from the Road & Rail Association, 5, Carlos Place, London, W.1.

Mailbag Missing from Train.—A mailbag containing five registered letters with a total value of £13,500 sent from Barnstaple, Devon was missing when the train reached Bristol, British Railways, Western Region, on August 3. Inquiries were made along the route between Barnstaple and Bristol, which included a change of trains at Taunton. It was thought that the mailbag might have been put on the wrong train at Barnstaple or Taunton.

Train Service Alterations in the Western Region.—Changes in train services between Paddington and Newbury are being made by British Railways, Western Region, with the introduction of the Winter timetable on September 12. Principal alterations affect the evening peak hour services, when the existing 5.30 p.m. train from Paddington to Plymouth, and the 6 p.m. to Weymouth will be combined to depart at 5.50 p.m., and arrived at Newbury at 6.52 p.m. Through coaches to Weymouth will be conveyed on this train. On Friday evenings, when traffic is heavy, the train will run in duplicate, the first portion leaving Paddington at 5.48 p.m. for Paignton, running non-stop to Taunton. The present 6.16 p.m. from Reading to Hungerford will be retimed to start at 5.55 p.m. and arrive at Newbury at 6.33 p.m., this affording an improved connecting service with the 5.5 p.m. train from Paddington. In addition, the existing 9.0 a.m.

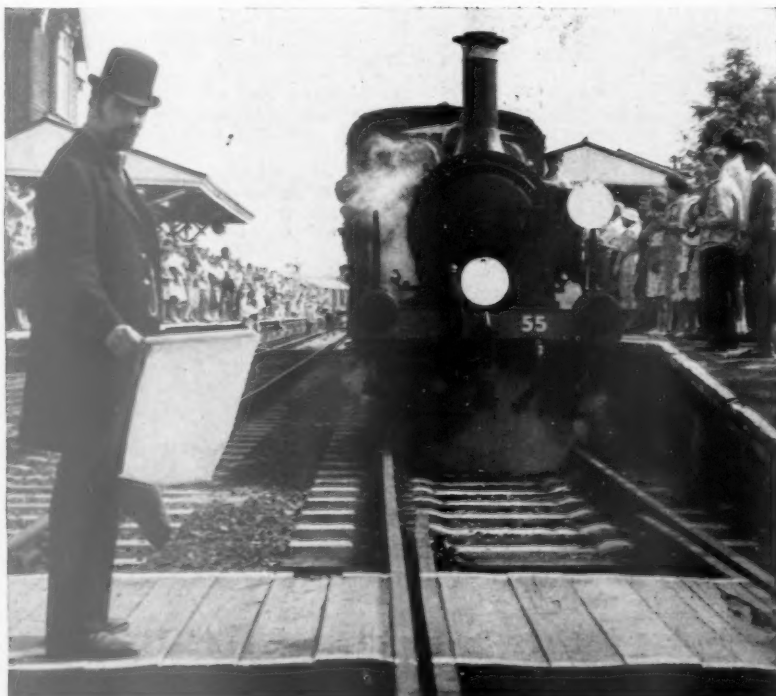
train from Weymouth which calls at Newbury at 12.2 p.m. and arrives Paddington at 1.15 p.m., will terminate at Newbury, an alternative service being provided by the 8.30 a.m. train from Plymouth which will call at Newbury at 12.18 p.m., providing service to Reading arriving at 12.42 p.m. and to Paddington arriving at 1.25 p.m.

U.K.R.A.S. Dinner to Senor E. M. Huergo.—The President of the Pan American Railway Congress Association, Senor E. M. Huergo, was the guest of honour at a dinner given by the United Kingdom Railway Advisory Service at the Savoy Hotel, London, on August 8. Brigadier A. E. M. Walter, Chairman of U.K.R.A.S., presided. Others present were: Brigadier C. A. Langley, Colonel D. McMullen, Messrs. J. Ratter, R. C. Bond, J. L. Harrington, J. Chadwick, N. Morton, A. D. Neale, M. P. Lamb, M. S. Trenaman, M. Crane, G. R. Curry, J. O. Sims, S. Potter, F. L. Castle, J. C. Kubale, F. Beasant, H. A. A. While, M. W. Shorter, L. G. Culleton, T. J. Aldridge, C. L. Trask, F. A. Manley, W. A. P. Manser, J. R. Gould, R. Millar, J. Wilson, P. Drew, and S. J. Bennett. Editorial reference is made on page 177.

Boy Killed on Railway Bridge.—Suction of a passing train is reported to have caused a boy to be killed on a bridge carrying the Leeds-Cardiff main line of British Railways, North Eastern Region, over a canal near Leeds. He was one of a party playing on the bridge. Two boys did not get clear as the train approached and clung to a railing at the side of the track. One was struck and the other unhurt.

Special Danger Notices on the Metropolitan Line.—The London Transport Executive has erected special posters on the Metropolitan Line between Rickmansworth, Amersham, and Chesham, warning the public that the high tension current on the newly-electrified lines will be switched on for the first time on August 14. More than 200 of the posters are going up on the trackside fences. They read: "Danger. This line has been electrified. It may mean your death if you climb over this fence. Keep out." In addition, larger posters are being put up at stations telling passengers to keep clear of the electric tracks as they are "live and dangerous," and to cross the line only by bridge or subway.

British Railways, Western Region, London Lecture & Debating Society.—The opening meeting of the 1960-61 Session of the Western Region London Lecture & Debating Society will be on Thursday, October 6, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.1. The President of the Society is Mr. J. R. Hammond, General Manager, Western Region. Programmes include addresses by Sir Arnold Hall, Managing Director, Bristol Siddeley Engines Limited; Mr. T. H. Summerson, Chairman, Design Panel, British Transport Commission; Major-General L. L. Wansborough-Jones, Secretary-General, British Transport Commission; Mr. E. Anstey, Chief Officer, Films, British Transport Commission; Mr. A. A. Cardani, Signal Engineer, Western Region; Mr. C. H. Chester, Chairman, South Western Gas Board, and Mr. F. D. Pattison, Assistant Operating Officer, Research, Western Region. Among the other activities programmed for the forthcoming season are debates with the Oxford University Railway Society, the Cardiff and Bristol Societies, the Railway Students' Association, an illustrated lecture competition with cash prizes of £10, £5 and £2, and a young men's discussion. Book tokens to the value of £3 3s. and £2 2s. will be awarded for the two best contributions, and consolation prizes of



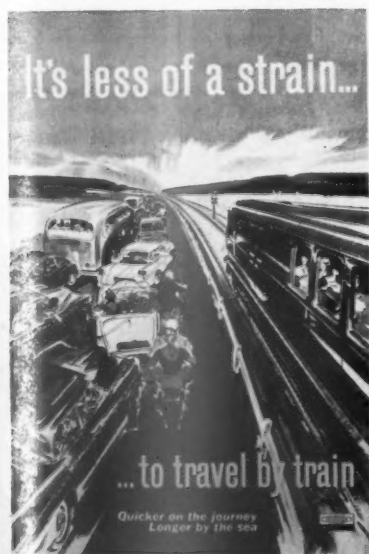
No. 55, a L.B.S.C.R. 0-6-0 "Terrier" tank, at Sheffield Park on August 7. The other Bluebell Line engine is a S.E.C.R. Wainwright "P" class 0-6-OT

£1 1s. Membership is open to all grades of employees of the Western Region of British Railways, and the annual subscription is 1s. Country members wishing to attend occasionally, can obtain free tickets at the discretion of the head of department. Application for membership should be made to the departmental area delegate or to the Hon. Secretary, Mr. H. L. Spooner, General Manager's Office, Paddington.

Increase in World Steel Output.—The world steel production of 187,274,000 net tons in the first half of this year is the highest half-year output on record. All the major steel producing countries, except the United States, recorded increases. The highest rates of increase were 40 per cent for Japan, 30 per cent for Italy, 28 per cent for Britain, and 23 per cent for West Germany.

British Display at the National Industrial Production Show of Canada.—British inventive skill in the field of production will be the centre-piece of a British display at the National Industrial Production Show of Canada, at Toronto next May. It is being arranged by the Birmingham Engineering Centre in conjunction with the Board of Trade. The Birmingham Engineering Centre staged a representative engineering exhibition at the British Exhibition in New York, and at the Toronto Show last year when 39 firms participated, many of whom will be represented again next year in Toronto.

Train Comfort Featured in Poster.—In its campaign to drive home, particularly to holidaymakers, the advantage of travelling in speed and comfort by rail rather than on congested roads, the Southern Region, British Railways, has produced a poster showing a railway line by the side of a road with a train passing a road traffic jam. The message is emphasised by the over-printed catch line "It's less of a strain to travel by train." Production was a rush job. The art work was commissioned and begun toward the end of June and the 3,000 printing order was placed with Waterlow & Sons Ltd. on July 1. Because of urgency the poster was drawn instead of being photolithoed. The sketch was cut down the middle to enable nine chromo artists to work on the 24 printing plates. As each plate was finished it was taken to a waiting machine. At the



Southern Region poster depicting train comfort contrasted with road congestion

end of the printing three 60 x 40 machines were running. Printing from start to finish took only 11 days. On July 12, the first 500 posters were delivered and the rest followed during the next two days. The poster was displayed at Southern Region stations and at commercial advertising sites in the London area before the height of the season.

New A.E.I. Birmingham Office.—On August 8 the Midland Regional Office of the Associated Electrical Industries (Rugby) Limited in Birmingham, moved from its addresses in John Bright Street and Hospital Street to the following address: Associated Electrical Industries Limited, Gloucester House, 65 Smallbrook, Ringway, Birmingham, 5. Tel.: Midland 6335, and Midland 9551.

Poster Warning Against Trespassing.—The double royal poster shown in the illustration was produced by the Eastern Region, British Railways, as part of a campaign against accidents to, and caused by, child trespassers. The lettering is red in a blue border. The poster is being displayed at stations throughout the Region.

Unexploded Bomb on Track.—A two-mile stretch was closed earlier this week between Kings Lynn and North Wootton on the line from Liverpool Street to Hunstanton, Eastern Region, British Railways, while a military bomb-disposal unit dismantled a 550 lb. bomb, found 18 ft. down in a meadow near the track.

Edgar Allen & Co. Ltd. Results.—Mr. W. H. Higginbotham, Chairman, Edgar Allen & Co. Ltd. reports in his circulated statement that the performance of the Engineering & Trackwork Departments in the year ended April 2, 1960, has been disappointing. In trackwork, sales fell by some 8.7 per cent from the previous years level, mainly because of lower export deliveries. There was an increase, however, in profits earned, the fall in sales having affected chiefly the less profitable types of output.

Railway Queen in North Wales.—On August 4, Miss Hazel Dobinson, Britain's Railway Queen, was welcomed to Prestatyn by British Railways staff and officials of Prestatyn Carnival Committee. In the afternoon she was crowned "Empress of Carnival." She later attended the Railway Queen's Ball at the Royal Lido in Prestatyn. On August 5, Miss Dobinson visited the War Memorial Hospital and the Alexandria Hospital at Rhyl and was filmed by B.B.C. television as she talked with patients and presented her bouquets to the children in the wards. A visit to Prestatyn Holiday Camp in the evening brought her visit and her year of office to a close, and she returned to Darlington on August 6. During her year of office, Miss Dobinson has made official visits to Shrewsbury, Woking, Darlington, Derby, York, London, Eastleigh, Southampton, Liverpool, Manchester, Battersea and Prestatyn.

Western Region Local Train Services Reduced.—Because of the serious shortage of staff in certain areas, British Railways, Western Region, announced that it was necessary to curtail the local passenger services over the following sections of line on and from August 8: Maidenhead-Bourne End-High Wycombe; Bourne End-Marlow; High Wycombe-Princes Risborough; Princes Risborough-Thame-Oxford. The services are reduced at off peak periods and first class facilities withdrawn on trains between Maidenhead and Bourne End after 8 p.m. Sunday services are not affected.

Gloucester Railway Carriage & Wagon Co. Ltd. Change of Address.—The Gloucester Railway Carriage & Wagon Co. Ltd. and

BRITISH RAILWAYS

SCHOOL HOLIDAYS 1960

TELL YOUR CHILDREN

and ask your children to tell their friends —

- 1 Trespass on the railway at any time is dangerous
- 2 In electrified areas trespass is foolhardy
- 3 During the summer holiday:
 - DON'T climb railway fences
 - DON'T trespass on the line
 - DON'T climb electrification masts
 - DON'T climb signal posts
 - DON'T throw things at the overhead wires
 - DON'T put obstructions on the line
 - DON'T throw things at trains

TO ALL SCHOOLCHILDREN—

have a happy holiday,
have a look at railways,
but — keep railways
and yourself safe

Eastern Region poster appeal to parents and to children on holiday

its subsidiary companies have transferred their London office to 1-5, New Bond Street, London, W.1, tel. Hyde Park 2956.

British Railways, North Eastern Region, Ambulance Movement.—During the 1959-60 winter courses for instruction in first-aid, the Regional Ambulance Secretary's report just issued announces that 170 classes were conducted in the North Eastern Region of British Railways. These classes were held at Newcastle (46), York (27), Darlington (26), Leeds (25), Hull (20), Middlesbrough (14), and Bradford (12). Some 2,902 students were successful in passing a first-aid examination, 264 having qualified for the first time.

Withdrawal of Passenger Facilities at St. Anthony's Station.—British Railways, North Eastern Region, has announced with regret that because of the loss incurred, passenger facilities will be withdrawn on and from September 12, 1960, from St. Anthony's Station on the Newcastle-Tynemouth via Riverside branch. Approval for this measure has been given by the Transport Users' Consultative Committee for the North Eastern Area. Alternative facilities for passengers are provided by bus services operated by Newcastle Corporation Transport and Tyneside Tramways.

Long Island Railroad Strike Settlement.—Railwaymen last week accepted a 24d.-an-hour pay cut under an agreement ending Long Island Railroad 25-day strike of the Brotherhood of Trainmen. The cut is to help meet the £127,000-a-year cost of the shorter working week they have won. The men, who towards the end of the stoppage were receiving £30 a week strike pay from their union, will work five days a week instead of six. They have also agreed to a re-allocation of working hours and to relax rules to permit higher efficiency. An immediate increase in fares will be sought by the company to meet its share of the cost of the shorter week. The average traveller will pay about £9 a year more for a season ticket. Long Island Railroad carries about 185,000 passengers daily.

St. Louis Car Company.—The St. Louis Car Company in the U.S.A. was acquired as from the end of June by General Steel

Castings Corporation. Apart from its wagon-building activities, the St. Louis company recently has been prominent in the production of subway cars.

British Oxygen Co. Ltd. Dividend.—The Board of the British Oxygen Co. Ltd. has declared an interim dividend of 6 per cent (4 per cent) on the £17,047,166 ordinary stock, less tax, for the year to September 30 1960.

Explosives Found on Railway Line.—Several packets of gelnite were found on the railway embankment near Richmond Station, British Railways, Southern Region, on August 8. Police believe the explosives may be linked with an attempt to enter Woolworth's store, near the station during the weekend.

Cavity Under Eastern Region Main Line.—An 8-ft. cavity appeared between the rails of the main line half-a-mile outside Kings Cross Station, British Railways, Eastern Region, when earth surrounding a sewer collapsed. Departure platforms 1 to 5 at Kings Cross were closed from 10.30 a.m. The line was reopened, after repair, just before 5 p.m. There were no appreciable delays to rush-hour trains.

"C"-Licence Holders' Traffic Committee.—A national traffic committee is being set up by the Traders' Road Transport Association, which represents "C"-licence holders. The object is stated to be to facilitate a closer and more specialised watch on developments, including proposed legislation. Another function would be an examination at national level of ways to widen T.R.T.A. contacts with official bodies and with trade and similar organisations. The committee will be concerned with England and Wales; the T.R.T.A. Scottish Division is appointing a similar body for Scotland.

Algoma Central & Hudson Bay Railway Company.—The net income of the Algoma Central & Hudson Bay Railway Company for the six months ended June 30, 1960, amounted to \$462,212, a decrease of 14 per cent compared with the same period a year ago. Earnings were equal to 81 cents per common share, compared with \$1.08. Decline in earnings was attributed to higher labour costs and lower steel industry traffic. Operating revenues for the half-year to June 30 were up 1 per cent at \$5,265,108, while operating expenses, including depreciation, rose 3 per cent to \$4,039,417.

Morgan Crucible Co. Ltd. Results.—The consolidated profit statement of the Morgan Crucible Co. Ltd. for the year ended April 3, 1960, shows the excess of income over expenditure as £2,091,000 compared with £1,766,000 for the previous year, an increase in gross earnings of £325,000. Mr. A. L. Stock, Chairman, reports in his circulated statement that this increase in profits before taxation has been achieved through an expansion in the parent company's sales of crucibles and particularly of carbon products, boosted by the recovery in trade of Morganite Resistors Limited and Morganite Incorporated, New York.

The Railway Enthusiasts' Club to Visit Carlisle Goods Yards.—The new marshalling yard scheme now under construction at Carlisle will mean the end of most of the pre-grouping goods depots, yards and lines there. The Railway Enthusiasts' Club is therefore arranging a special rail tour, by diesel train, to cover as many of these yards as possible. The special train will run on September 10, starting from Carlisle Citadel at 2.20 p.m., and will tour by a complex

route the depots at Canal Yard, Bog Yard, London Road, and Crown Street, returning to Citadel at 4.58 p.m. The fare for the tour will be 7s. 6d., and applications for tickets should be made to Rail Tour Bookings, Railway Enthusiasts' Club, Farnborough, Hants.

Originality in New L.T.E. Poster.—The most recent London Transport Executive travel poster, "Enjoy your Summer," depicts a young couple picnicking beneath a tree. The artist has used fabrics of various colours and textures, stitchcraft and embroidery, to give a 3-dimensional effect which has been preserved in a poster by photolithography. Special lighting was used to bring out the shadows for the 3-D effect when the work was photographed.

Inland Waterways Association Exhibition.—The Inland Waterways Association exhibition of craft and equipment was opened by Sir John Wedgwood, Deputy Chairman of Josiah Wedgwood & Sons Ltd., at the National Rally of Boats at Stoke-on-Trent last Monday. At the opening ceremony he stated that there were 3,000 miles of canals and rivers in the U.K. Britain's means of communication had fallen from the top to the bottom of the league during the twentieth century. "Our roads are easily the worst in the world and the railways are slow, gloomy and unpunctual," he claimed. Perhaps inland waterways, to which the whole pottery industry owed its original greatness, could lead Britain to the top of the league again.

Forthcoming Meetings

August 14 (Sun).—Electric Railway Society.

Members visit to Southampton-Hythe Ferry and Hythe Pier Railway.

August 20 (Sat).—British Railways, Southern Region, Lecture & Debating Society. Visit to Ipswich diesel depot.

September 2 (Fri).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, E.C.4, at 7 p.m. Members' meeting and paper by Mr. H. A. Vallance on "North of Inverness."

September 3 (Sat).—British Railways, Southern Region, Lecture & Debating Society. Visit to Redbridge sleeper depot.

September 4 (Sun).—The Railway Correspondence & Travel Society. Cumbrian rail tour.

OFFICIAL NOTICES

ASSISTANT TO CHIEF CIVIL ENGINEER required by British Railway Company in Chile. Early prospects of promotion to Deputy Chief Engineer. Applicants must have railway experience; aged about 35/45 years; qualifications to A.M.I.C.E. standard. Sterling salary, allowances, retirement benefits, free quarters, passages, three-year tours, home leave, etc. Write to Box 3580 c/o Charles Barker & Sons Limited, Gateway House, London, E.C.4.

Foreign Employment ROADMASTER

ENGINEERING GRADUATE preferred; minimum of two years engineering training essential.

Require two years varied railroad engineering service, or five years in direct change of track crews. Will supervise 135 men maintaining 45 mile railroad, assign work, order materials, be responsible for safety, make regular detailed inspections of roadbed and all track on main line, sidings and yards, bridges, tunnels, etc. Will make engineering calculations relating to maintenance and use of structure and equipment. Must speak Spanish. Married or single candidates acceptable.

Excellent opportunity large copper company, Chile, South America. Two year contract with transportation both ways for you and family. Basic salary \$525.00 to \$650.00 per month depending upon age and experience of applicant.

Box 6, The Railway Gazette, 33 Tothill Street, S.W.1.

Railway Stock Market

Although holiday influences are making for a reduction of business in stock markets, share prices have been firmer, and there were a fair number of good gains, though buying has been very selective. Few dealings recorded among foreign railway stocks, which were without important features. News of the good increase in the gold and convertible currency reserves in July helped sentiment because it suggests that the next change in bank rate, although it may not come until towards the end of the year, is likely to be downwards.

Antofagasta ordinary stock rallied from 12½ to 13, and the 5 per cent preference stock was 30 compared with 29½ a week ago. The 4 per cent perpetual debentures were quoted at 47½.

Firmness in Costa Rica ordinary stock was maintained with a rise of a further point at 43½; the first debentures were 94½ and second debentures 112½.

Guayaquil & Quito assented bonds were 69½xd, and Chilean Northern first debentures 56½. Brazil Railway bonds kept at 6½. Paraguay Central period debentures were 17½. Sao Paulo Railway 3s. units were again 1s. 1½d., but United of Havana second income stock strengthened from 6 to 6½. Mexican Central "A" bearer debentures eased from 60 to 59½.

International of Central America common shares were \$20 and the preferred \$105½.

Canadian Pacifics as usual, moved closely with Wall Street, and at \$41½, compared with \$42½ a week ago. The preference stock was 56 and the 4 per cent debentures 61. White Pass shares changed hands around \$11½.

Elsewhere, Nyasaland Railways shares eased from 9s. 6d. to 9s.; the 3½ per cent debentures were 46½, compared with 46½ a week ago. Midland of Western Australia income debentures have changed hands around 27½; the first debentures were quoted at 70½ and the ordinary stock at 6½.

Barsi Light Railway stock was 18. West of India Portuguese were dealt in at 111½ and the 5 per cent debentures up to 93.

A feature among shares of locomotive builders, engineers and kindred companies has been a rise from 12s. 9d. to 14s. 6d. in Wagon Repairs 5s. shares. The latter remained under the influence of the results showing a sharp advance in profits, while a 10 per cent bonus accompanies the maintained 20 per cent dividend in addition to the proposed 15 per cent, tax free, distribution arising from the winding up of two subsidiaries. Birmingham Wagon were 38s. 4½d., compared with 39s. a week ago.

North British Locomotive kept at 8s., but Gloucester Wagon 10s. shares came back from 13s. to 12s., though elsewhere, Beyer Peacock 5s. shares have been firmer at 7s. 3d. G. D. Peters were again quoted at 16s. 3d., and Westinghouse Brake firmed up to 45s. 3d.

English Electric rallied from 36s. 3d. a week ago to 39s. 1½d., General Electric from 33s. to 35s. 3d. and Associated Electrical from 49s. 7½d. to 50s. 4½d. Crompton Parkinson 5s. shares were higher on balance, too, at 14s. 1½d. compared with 13s. 9d. a week ago.

Holman Brothers 10s. shares have been firm at 21s. 9d. though the dividend is unchanged at 12 per cent despite higher profits. Broom & Wade 5s. shares were 20s. 9d. A strong rally from 30s. 3d. to 32s. 1½d. was shown by Vickers. Guest Keen rose from 89s. 9d. to 95s. 6d. and Ruston & Hornsby rallied from 25s. 4½d. to 26s. 3d. while Stone-Platt have been firm at 55s. 9d. Dowty 10s. shares held steady at 36s. Pressed Steel 5s. shares rose from 28s. to 28s. 9d. Ransomes & Marles 5s. shares were higher at 26s. and Pollard Bearing 4s. shares 43s. 3d.

